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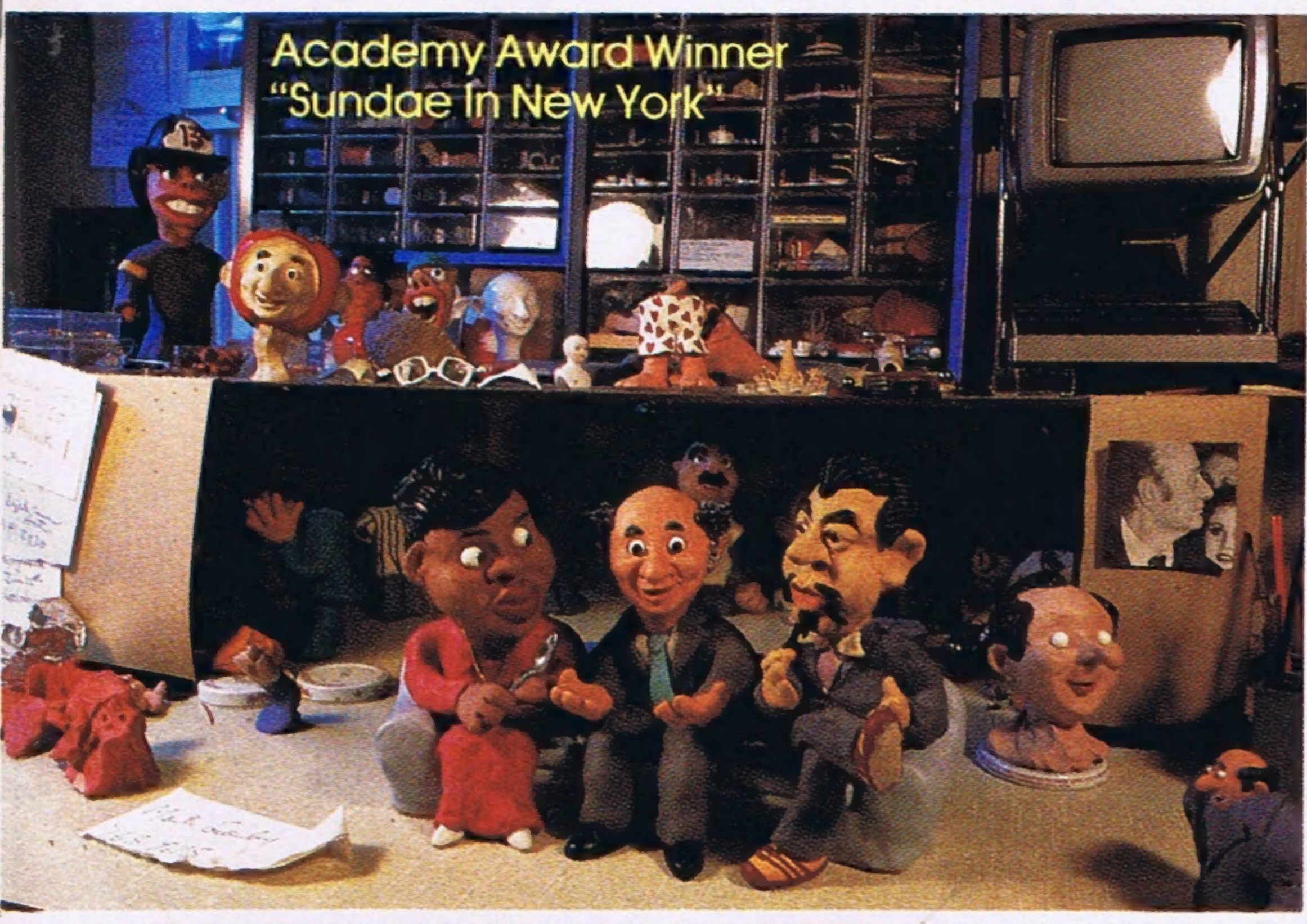
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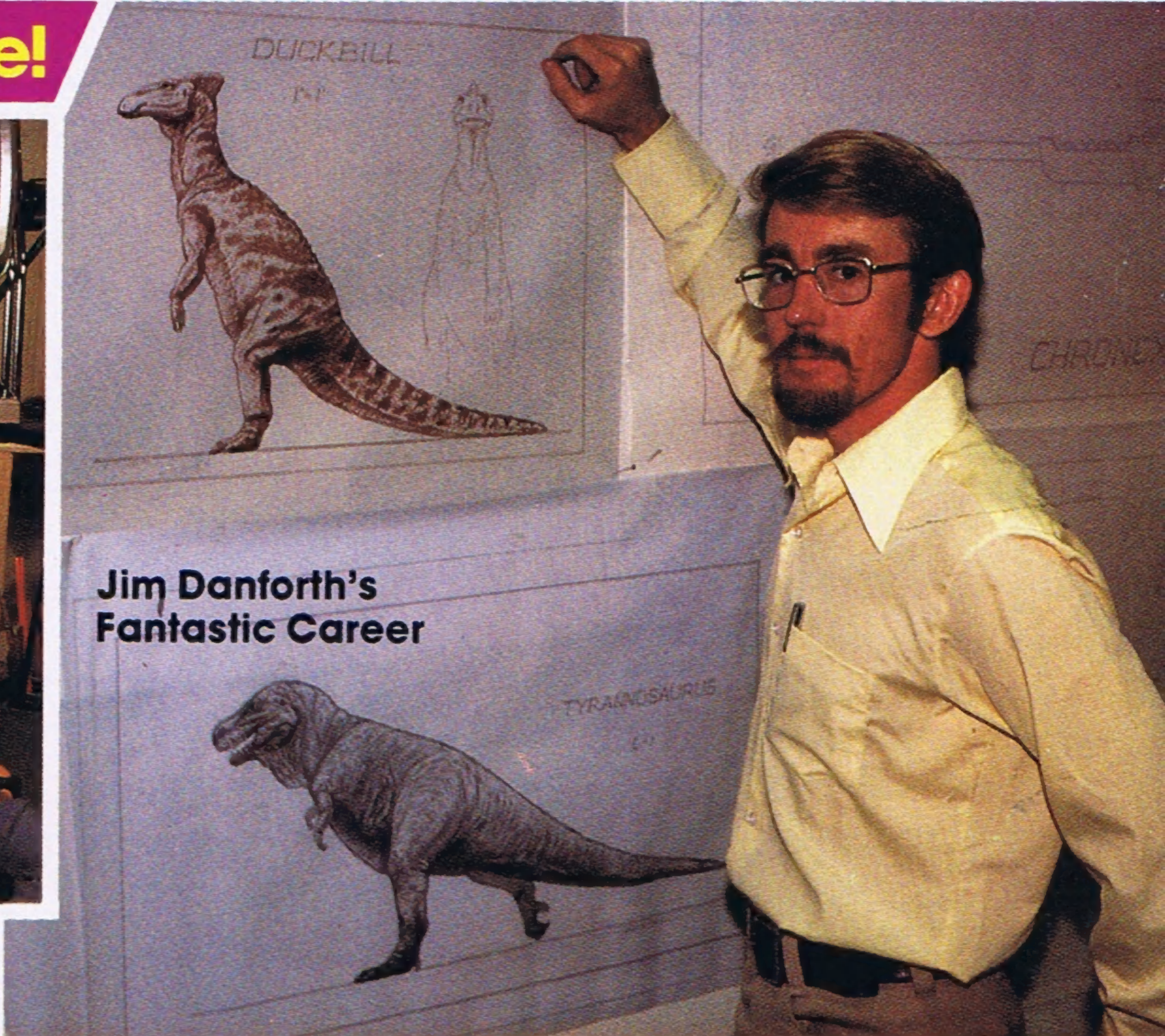


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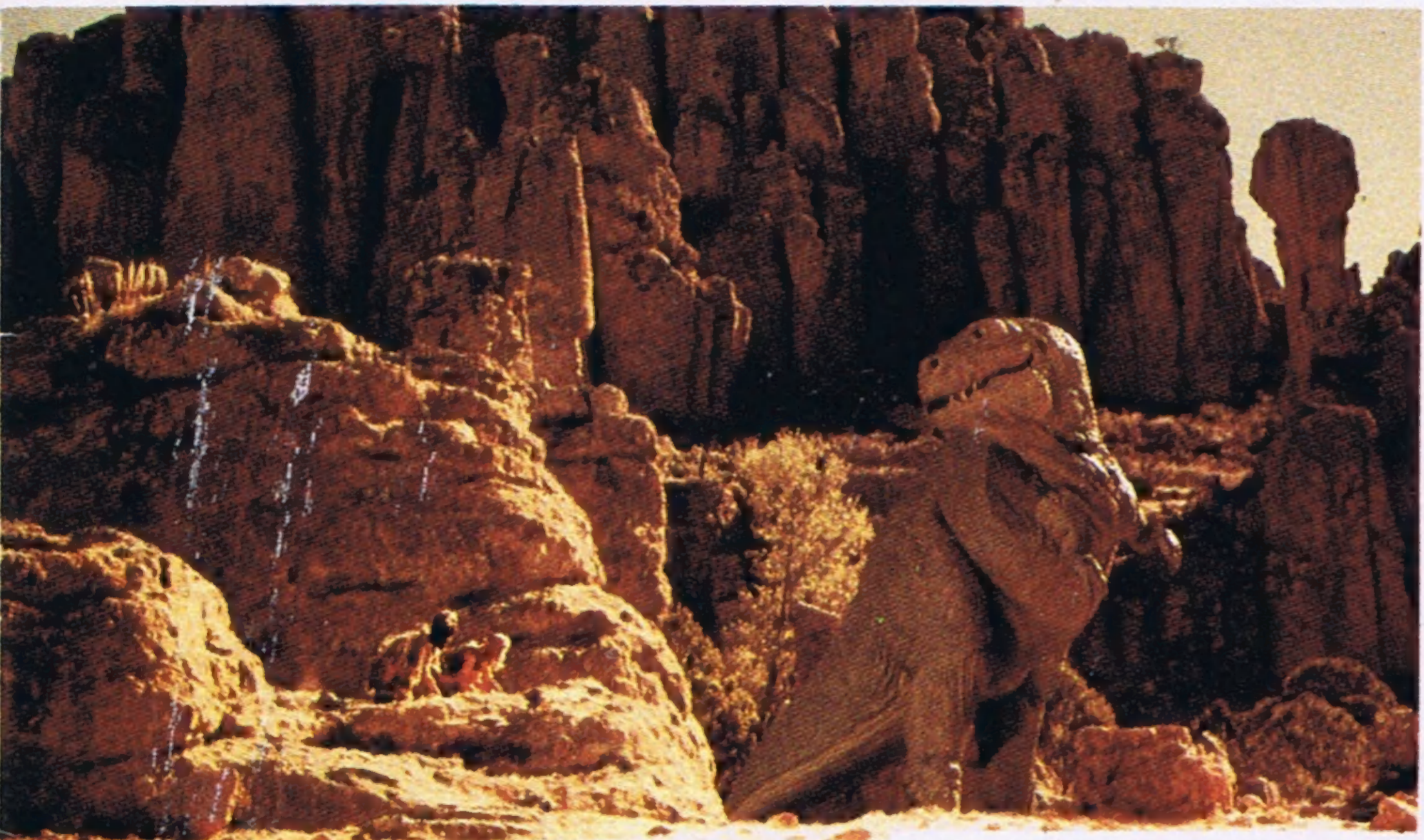
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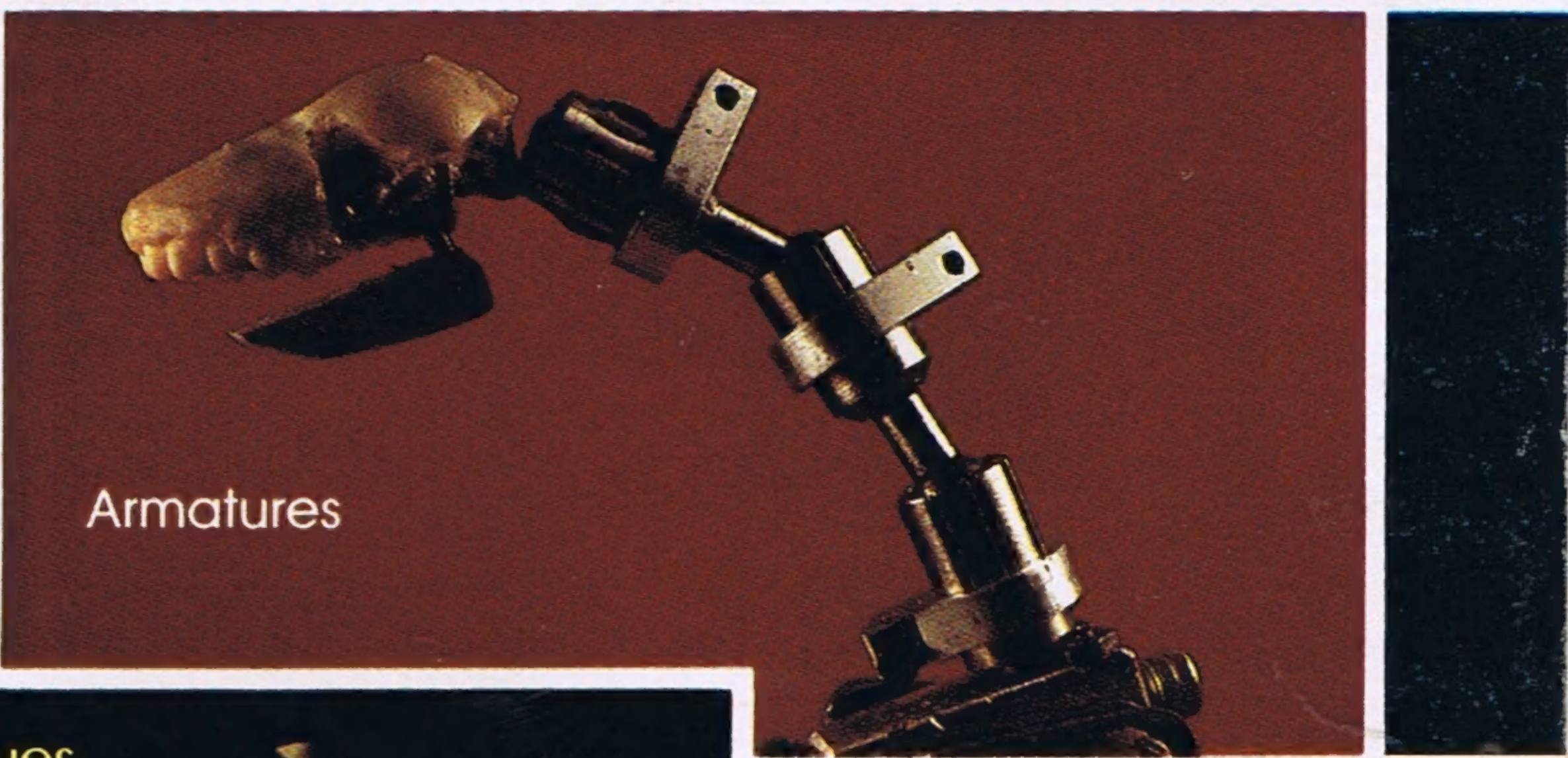
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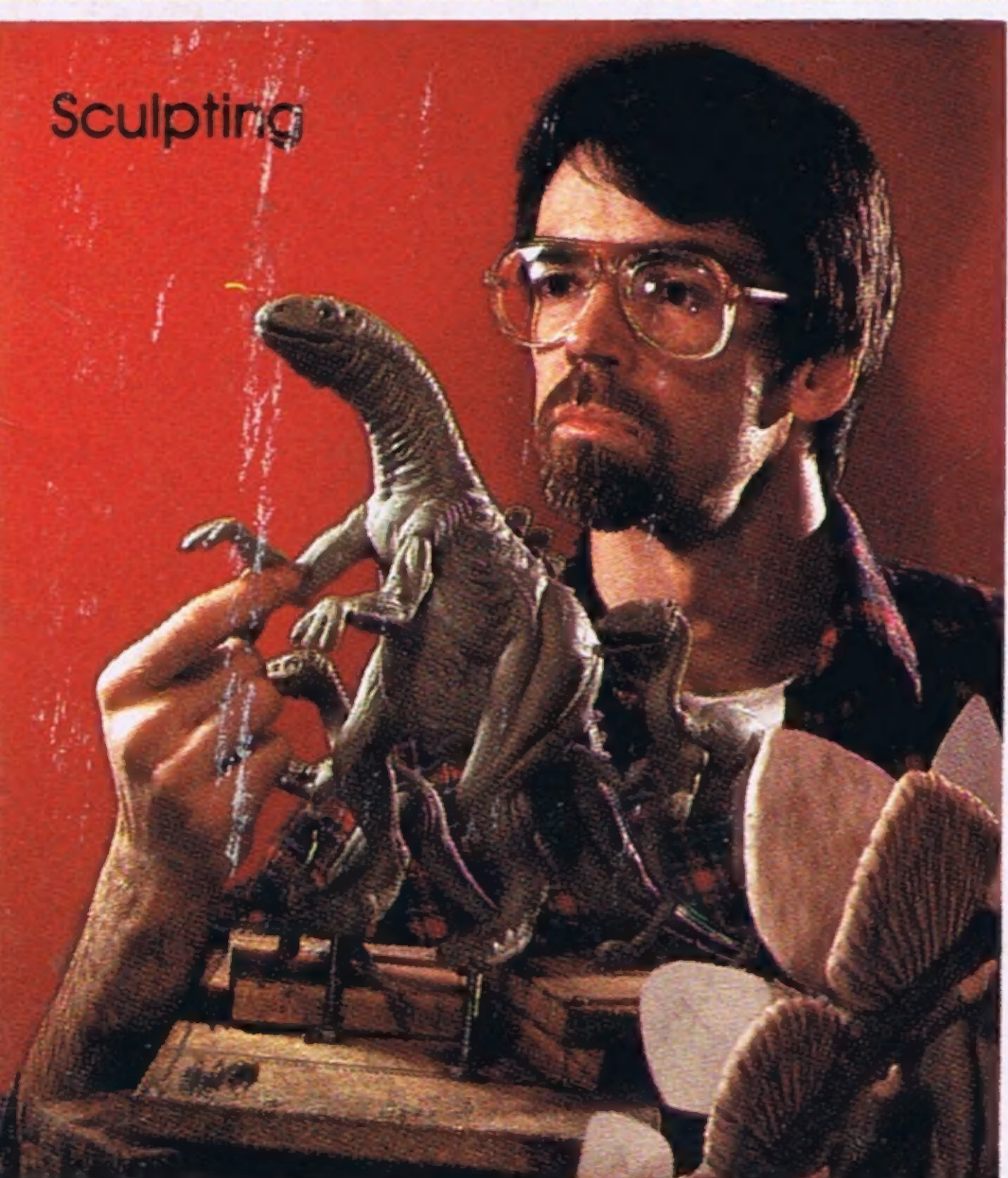
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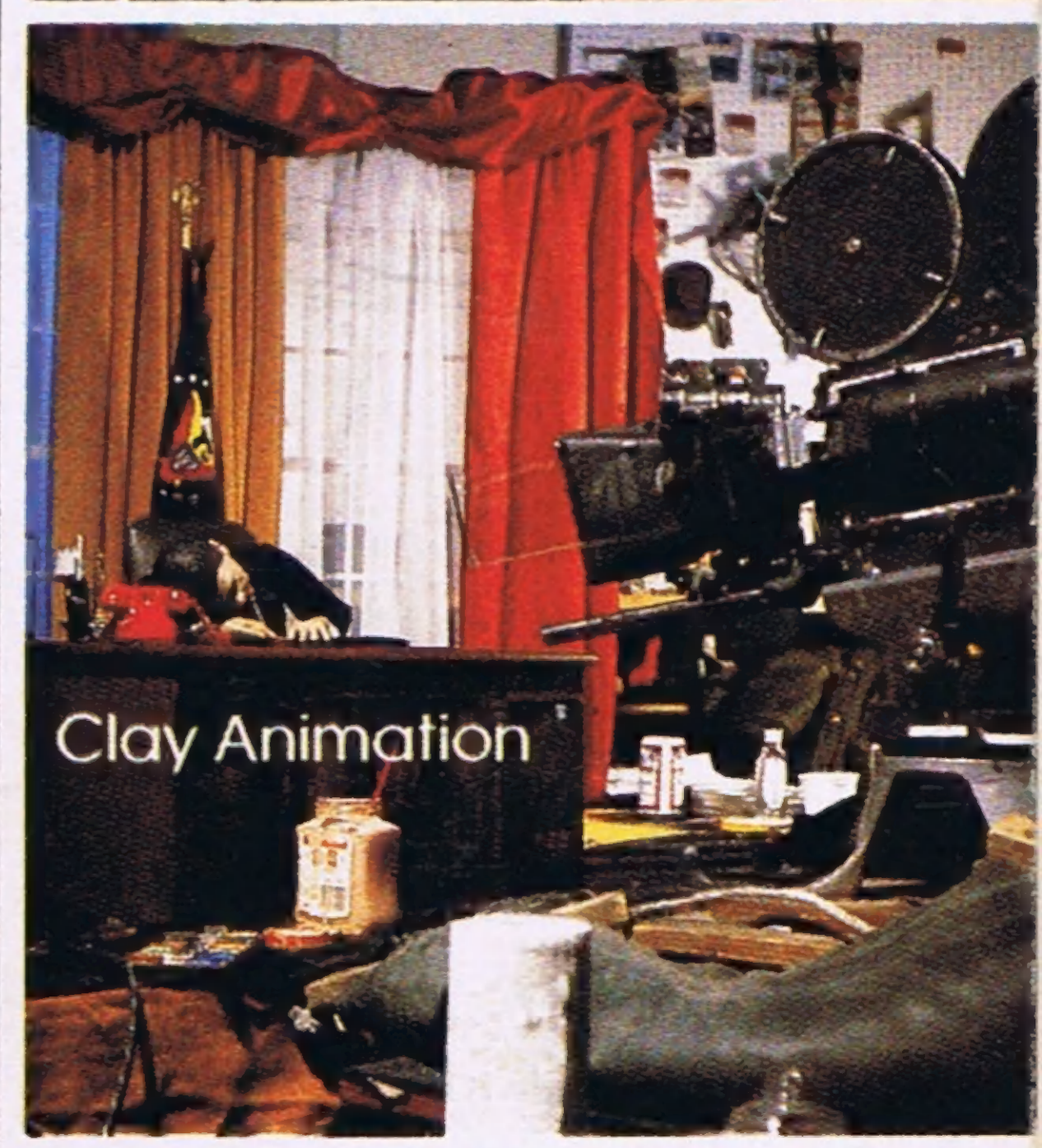
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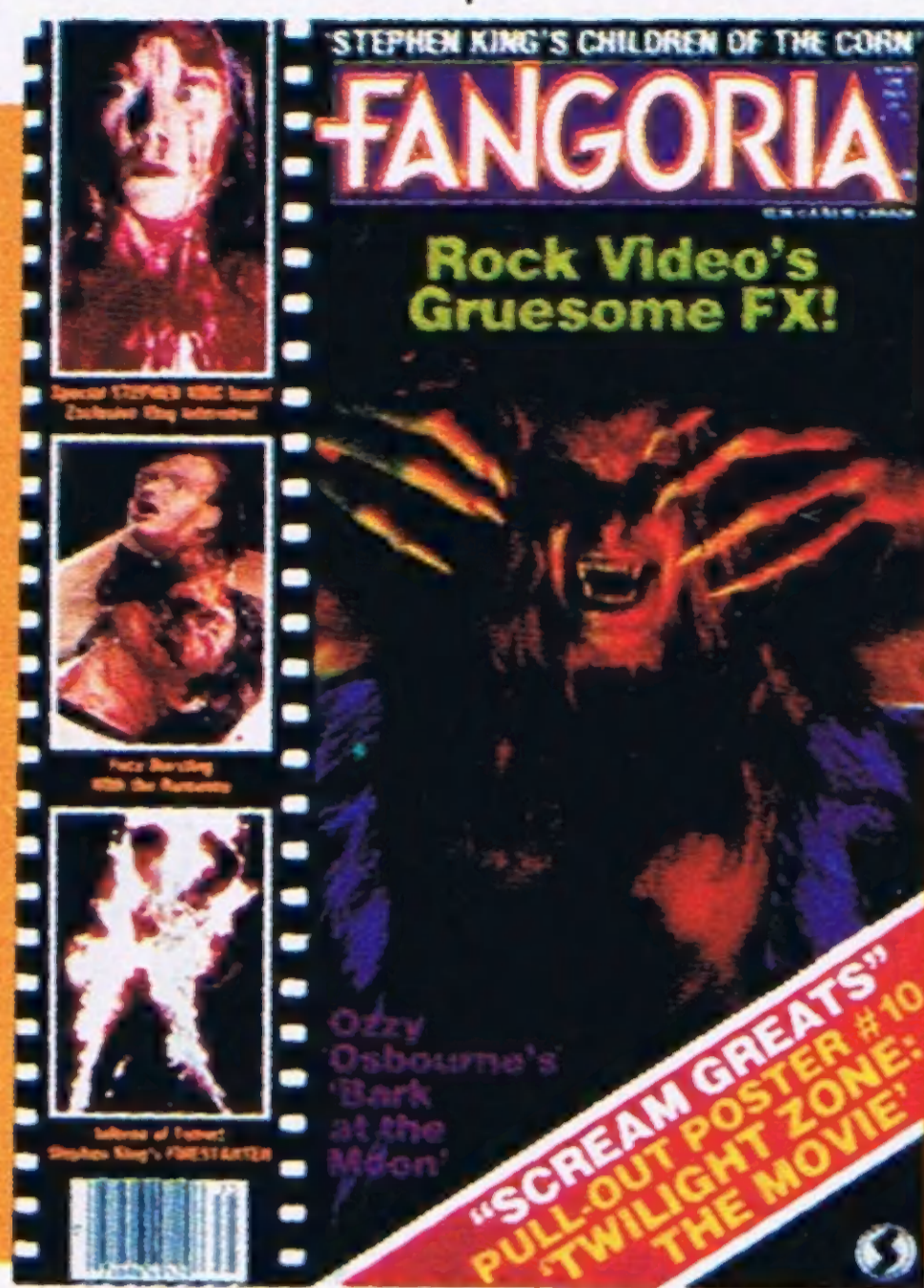
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About the Cover: (Clockwise from top left) Clay stop-motion caricatures of famous politicians are featured in Jimmy Picker's *Sundae in New York*, for which Picker won this year's Academy Award for Animation—Photo by John Clayton (see page 18); Jim Danforth's career is profiled by CINEMAGIC's John Dods in this first part of a two-part series—Photo of Jim Danforth by David Hutchison (see page 13); Ken Walker constructs a ball-and-socket dinosaur skull armature—Photo by Ken Walker (see page 28); A stop-motion Ronald Raygun saves America (or does he?) in Peter Wallach's *Raygun's Nightmare*—Photo courtesy of Peter Wallach (see page 46); Dave Carson renders a matte painting on glass to illustrate Paul Mandell's story on "Rear Screen Matte Techniques"—Photo courtesy of Paul Mandell (see page 36); Ken Brilliant gives some handy tips on "Sculpting in Clay"—Photo of John Dods by Ken Brilliant (see page 44); A shot of Dave Allen's work on *Caveman* illustrates Paul Mandell's story on "Split Screen Dynamation Effects"—Photo courtesy of Paul Mandell (see page 26).

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BENCH

Fantasy Filmmaking at its Finest

It certainly has been a super summer for fans of fantasy film. Just look at the lineup. *Indiana Jones and The Temple of Doom* featured some superlative split-screen composites and miniature work climaxing in a runaway mine car thrill ride for the audience. *Star Trek III* continued its tradition of visual magnificence in the space station docking sequence and the *Enterprise's* glorious finale.

The Last Starfighter breaks new ground in computer special effects. Traditional models and motion-control photography were abandoned for the awesome power of the super-computer. John Whitney Jr and Gary Demos of Digital Productions created over 20 minutes of special effects sequences entirely within a CRAY XM-P computer.

Winning the award for most fun fantasy films of the summer are *Ghostbusters* and *Gremlins*. *Ghostbusters*, with effects supervised by Richard Edlund, moves a step or two beyond his previous ghostly endeavor *Poltergeist*. *Gremlins*, a black comedy done in the style of a Warner Brothers cartoon, makes use of nearly every special effect in the book.

Puppet films, a special effect in themselves, are still going strong with *Neverending Story*, effects by Brian Johnson, which features fullsize and miniature puppets, and *Muppets Take Manhattan*, the third film featuring the talents of Frank Oz and Jim Henson.

Not yet viewed at press time, *The Adventures of Buckaroo Banzai: Across the Eighth Dimension* promises to be the special effects phantasmagoria of the summer.

Fantasy film fans have never had so rich a season to view—and learn from—for the films you watch today may become the classics that you remember tomorrow when you are working on your own projects. In this issue we feature a story about Academy Award winner Jimmy Picker who walked away with the Oscar for Best Animated Short this year. *Sundae in New York* is only three minutes long, shot on the tiniest fraction of a budget, but is no less fun than any of the other "big" films seen this summer.

What I'm getting at is that *you* can do it, too. You don't just have to sit in the theater and drool over the latest Spielberg/Lucas effort and dream about working with their budgets or facilities. Richard Edlund and the team from I.L.M. collected their Oscar for millions of dollars worth of *Jedi*, but Jimmy Picker was there, too and his Oscar sits just as proudly on his shelf.

--David Hutchison

* * * * *

Rules and entry forms for the next CINEMAGIC/SVA Short Film Search are now available. There have been minor revisions in the rules, but the major requirements remain the same with the same maximum length of 15 minutes (preferably less). For your copy of the rules and entry form, send a #10 size S.A.S.E to: CINEMAGIC/SVA Search, 475 Park Ave. So., N.Y., NY 10016. Deadline for entries: October 1, 1984.

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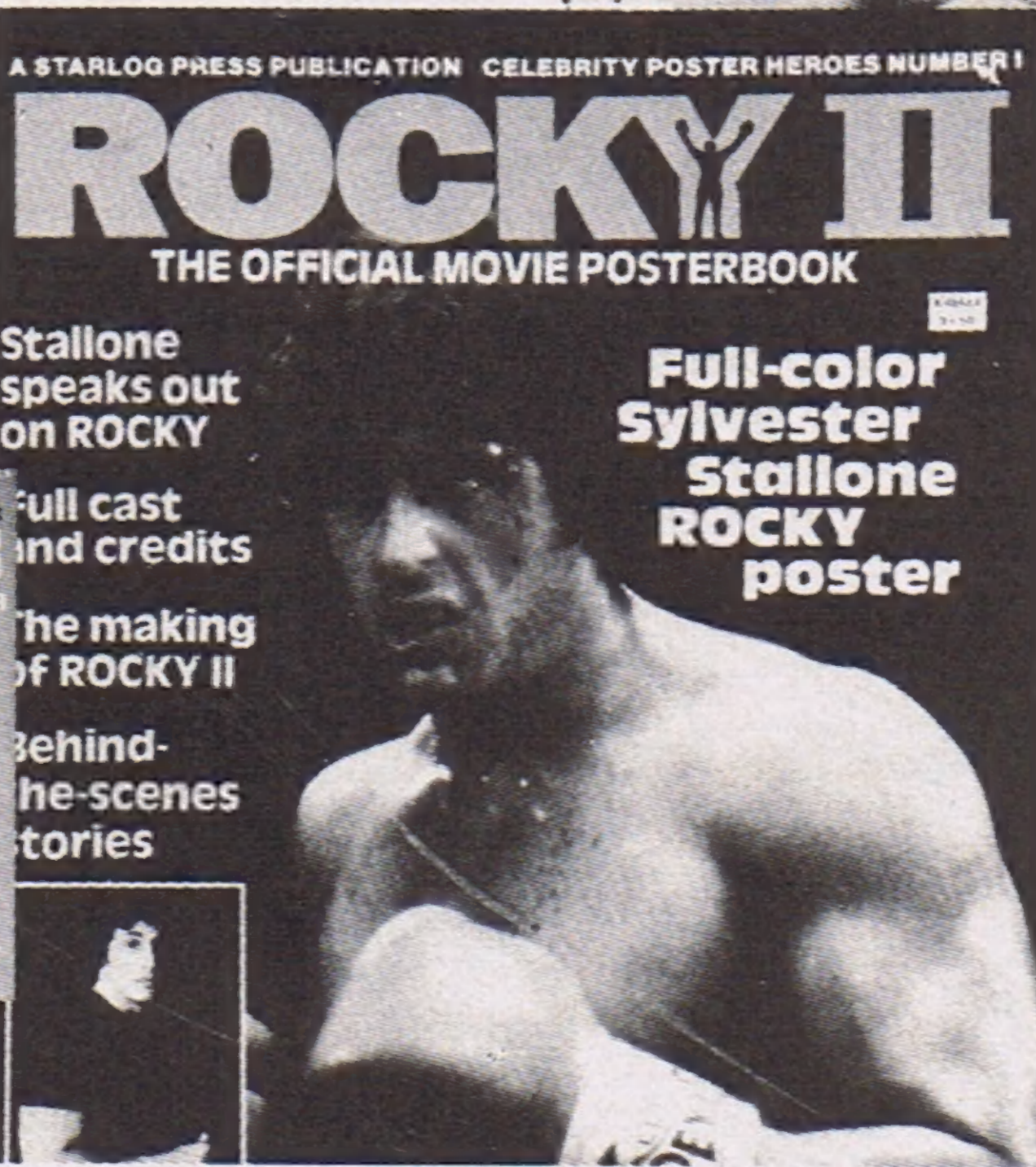
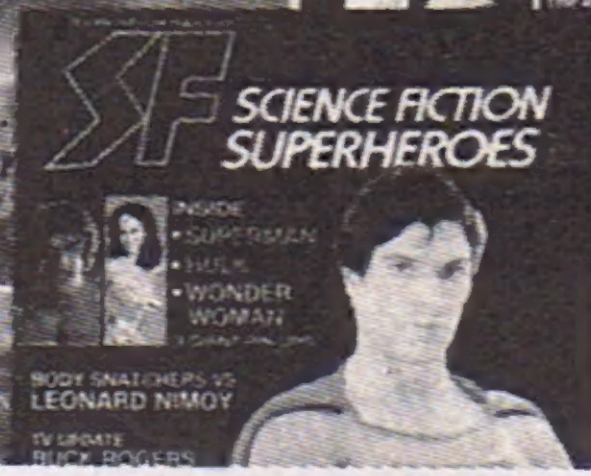
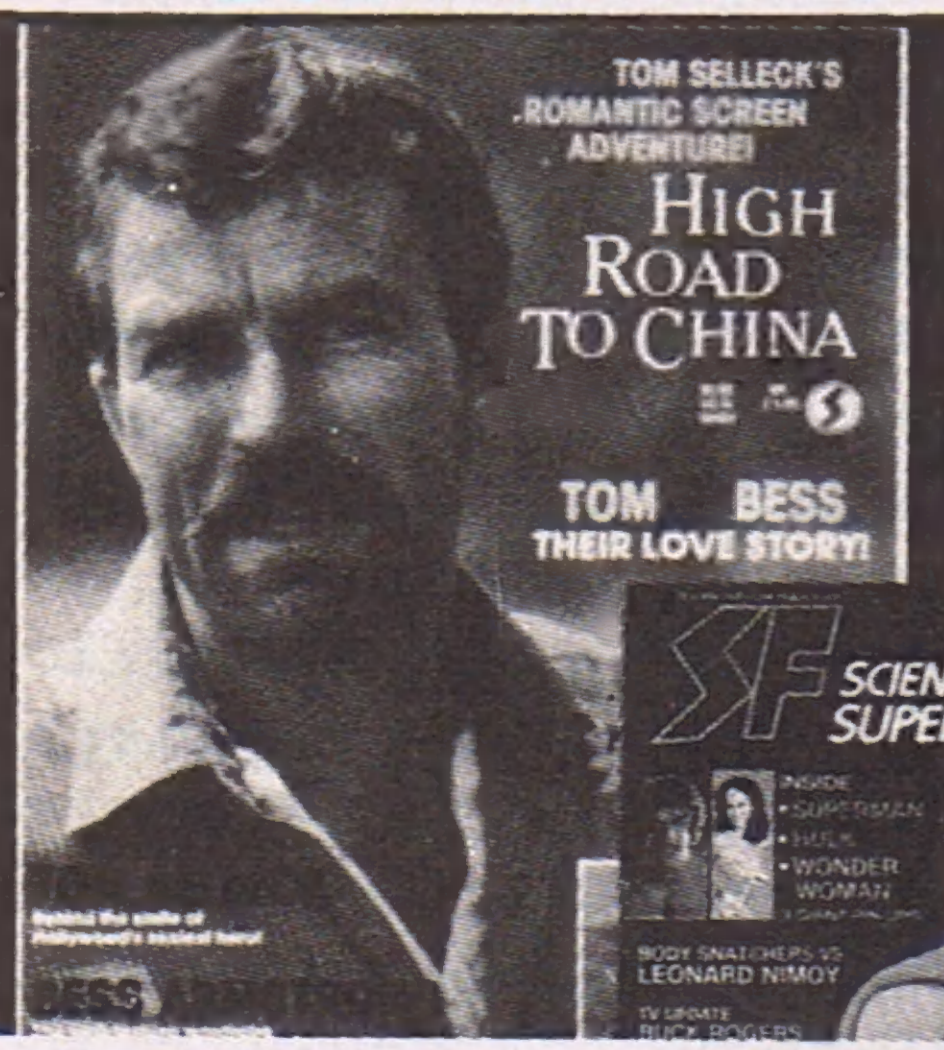
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Between Tupelo and Hollywood

Mississippi-born animator Rob Baggett found that it wasn't necessary to move to Hollywood to break into the film business

By ROB BAGGETT



PHOTOS: COURTESY OF ROB BAGGETT

Baggett took Form through several stages before arriving at the final design.

When I was five, I saw the original *King Kong*, and since then, I have been fascinated with stop-motion animation and special effects. For years I sculpted clay creatures and acted out endless fantasies as I moved their legs, arms, head and tail into different positions, giving them a kind of life in my own mind.

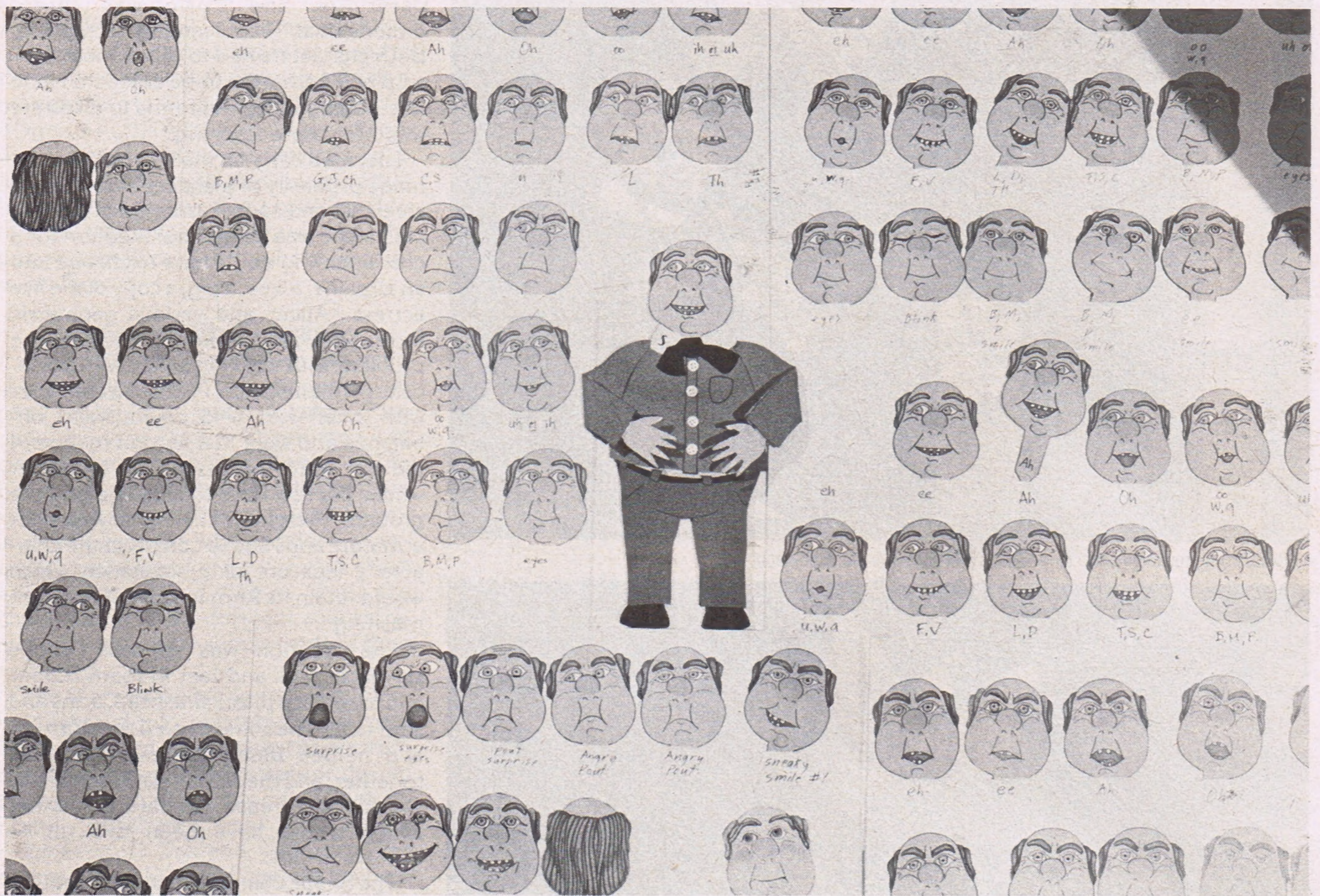
At sixteen, my need to bring these creatures to life led me to experiment with stop-motion animation. By taking a single frame of film, or even two or three frames, of each new pose, I brought my creatures to life on screen and shared my imaginary world with others.

This satisfied me for a while. I earned a music degree and continued my animation as a hobby. I thought that people from Tupelo, Mississippi did not grow up to be Hollywood filmmakers, so I suppressed my desire to create fantasies for a living. But one day I realized there were a lot of stops between Tupelo and Hollywood.

One of my films had won first place in a film festival sponsored by Kentucky Educational Television in Lexington, Kentucky, a place known more for thoroughbred horse farms than for filmmaking. As part of my award, I was given an informal tour of the facilities, including a Master series Oxberry animation stand, the best there is! I learned that KET had a national reputation for quality productions which often included special effects.

After the tour, I knew I did not have to start in Hollywood. I applied for a job as a film trainee at KET. Eventually, I became a cinematographer, and I occasionally got to animate. Finally, I became an animator. I tried to sell the producer/directors on effects for their programs. What I especial-

Rob Baggett now runs his own company, Animation Farm, in Spartanburg, South Carolina. The company's slogan, "Animated characters home grown in the Southeast," reflects his commitment to regional filmmaking. He is currently working on an agreement with E.O. Studios, a twelve million dollar complex in nearby Shelby, North Carolina, which he hopes will enable him to apply his special effects techniques to low-budget feature filmmaking. The Arts Express series is now available free to all PBS affiliate stations. Check the daytime (in-school) schedule for broadcast time in your area.



The many faces of Shape, who required a very complete series of replacement animation forms.

ly wanted to do was to bring characters to life in the "real world," like in *King Kong*. P/D George Rasmussen was interested, and he had an important series in the works. Months later, he handed me a script.

Shape and Form

My assignment was a challenging one: to provide animation and special effects for a fifteen-minute program involving a live actress, the Hirshhorn Museum and Sculpture Garden in Washington, D.C. and the antics of Shape and Form—two of the most quarrelsome animated characters ever to appear on the screen. I was also to create various bits of animation and special effects for several of the other 19 programs in the Arts Express series being produced for elementary school students by Kentucky Educational Television. The nearly 10½ minutes of animation were to lead me to a thorough working knowledge of front projection, rotoscope, aerial image photography, color correction filters, and a variety of other subjects not often discussed in Tupelo.

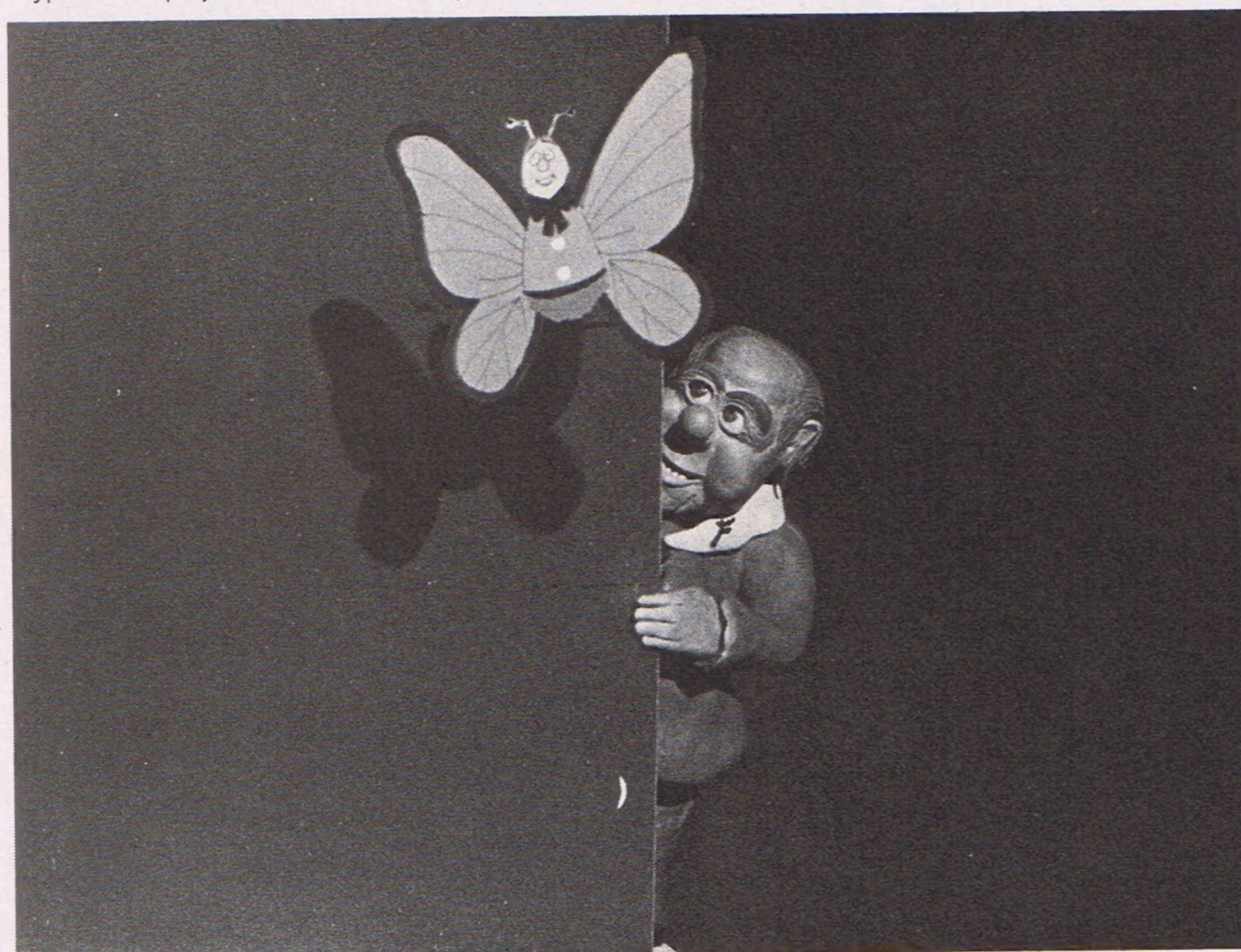
My first step was to design the characters. Having chosen an "Alice in Wonderland" theme; writer Richard Smith, producer/director George Rasmussen and I already had decided that Shape and Form were to be twins, similar to Tweedle-dee and Tweedle-dum. The only difference between them was that Shape was two-dimensional, representing



In this publicity shot Form, Light and Linus the Line from Arts Express pose with their creators Rob Baggett, Michael Griffith and Terry Schoen.

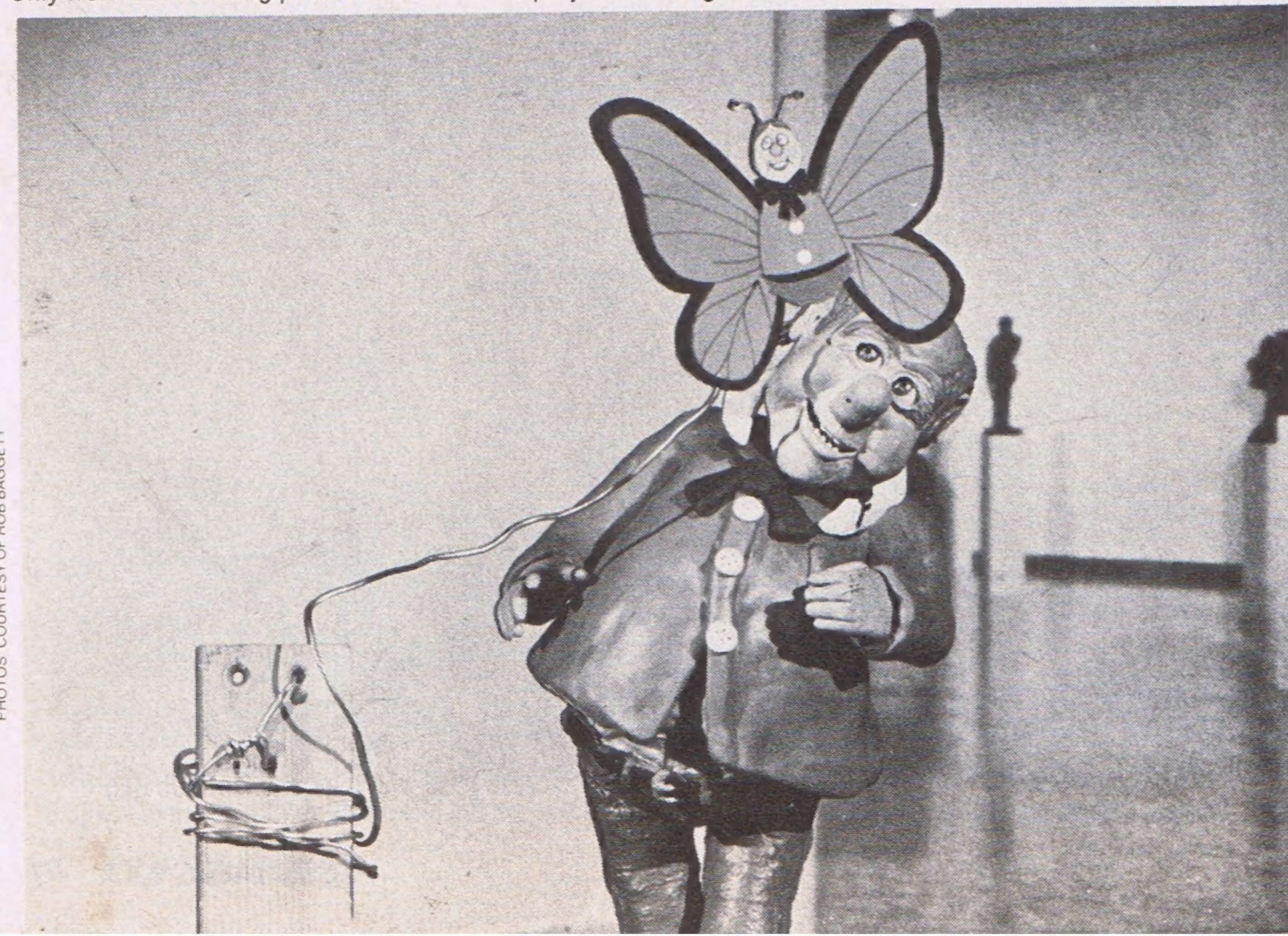


A typical front projection shot. First, Shape and Form are put in position.



Second, a front projection cut-out is placed in front of Form, but behind Shape.

Only from the shooting position can the front-projected background be seen.



PHOTOS COURTESY OF ROB BAGGETT

paintings, and Form was three-dimensional, representing sculpture. Both characters had to talk almost non-stop and both were to be able to change into other shapes and forms to illustrate what they were teaching.

I decided early on that Form had to be made primarily of plasticene clay over a steel ball-and-socket armature. I felt that plasticene was the natural medium for a character who would have to change into an airplane, a tree, a pig, a copy of the live actress "Alice" and various geometric forms. But as I worked, I discovered a problem with working solely with plasticene in this instance. I wanted a character with small feet who could stand off-balance and walk in a natural manner. I did not want the usual clay character whose big feet have to shuffle along the ground. Therefore, I had to have a tight armature and I had to construct the character's legs out of a substance which would retain its form in spite of constant mashing.

The solution was to cast Form's stomach, legs and feet in foam rubber and to sculpt a plasticene head, arms and shirt to fit. The shirt covered the stomach and helped blend the two materials together, and the rubber pants tended to wrinkle and crease in a natural manner which would have been difficult to achieve in clay.

The Shape character involved another set of problems. Artist Ethel Warren designed a paper doll based on my Form character. His body consisted of color aid paper with a wire armature sandwiched between. Pockets and other details were drawn on the paper with a rapid-o-graph pen.

Replacement Animation

Because of the many lines of dialogue that Shape had to deliver, we had to find the most economical method possible to animate his face. After several discussions, Ethel and I determined that a series of replacement heads that could slip into Shape's collar was the best solution. Ethel began with pencil drawings on cel animation paper. This allowed her to use standard cel animation techniques to register each drawing. After she had drawn Shape's face, forming fourteen different vowels and consonants, Ethel traced the pencil drawings in ink onto tracing paper. Somehow she managed to cram them all onto one 8½" x 11" sheet. Then she xerox copied the ink drawings onto colored paper by putting a sheet of flesh-colored Pantone in the alternate paper tray of the Xerox. All that was left to do then was to cut out the faces and color them with paint, colored pencils and felt tip markers.

Of course, fourteen faces do not provide a very wide acting range. Ethel's work had solved most of the technical problems, but, to complete the task, artist Jeff Greer was hired to render about

130 smiling, angry, shouting, pouting, sneaky, and surprised Shape faces and to design and complete Shape's transformations into talking geometric shapes, a frisbee, a butterfly and an "Alice" clone, which splits in half to demonstrate symmetry. Jeff also worked tiny plastic tubes into Shape's feet so that I could anchor him to the animation stage floor by pushing small nails through the floor into his feet.

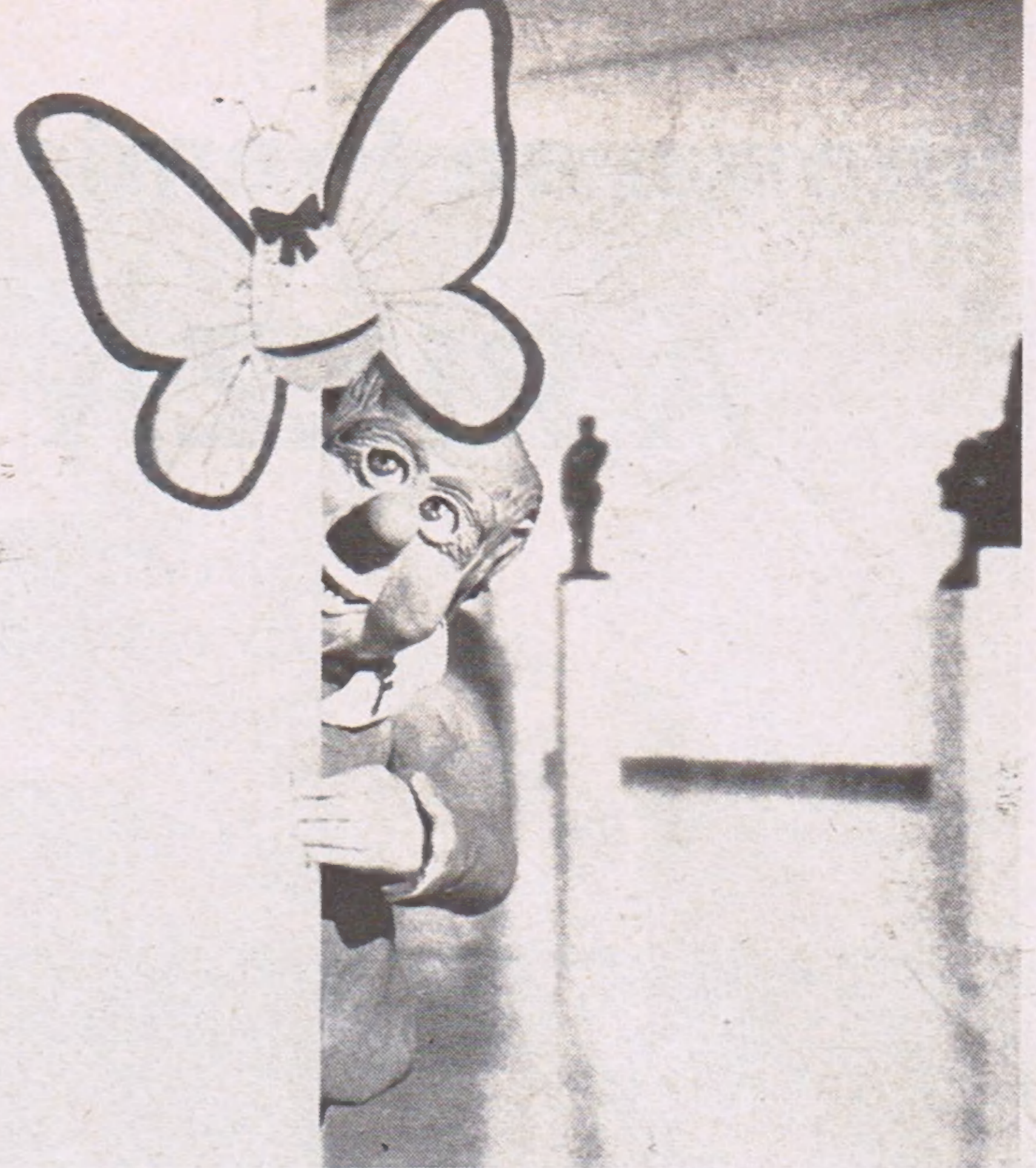
Animation Photography

Once Jeff's work on Shape was underway I finally was able to begin special effects animation photography. Producer/director George Rasmussen and cinematographer/editor Martha Chute had rough cut the film. They had also inserted the voices of actors John Shuck and Jack Johnson who had done an excellent job portraying the voices of Form and Shape. Now I had to work the characters into 51 different scenes requiring 94 separate shots or cuts of their animated acting.

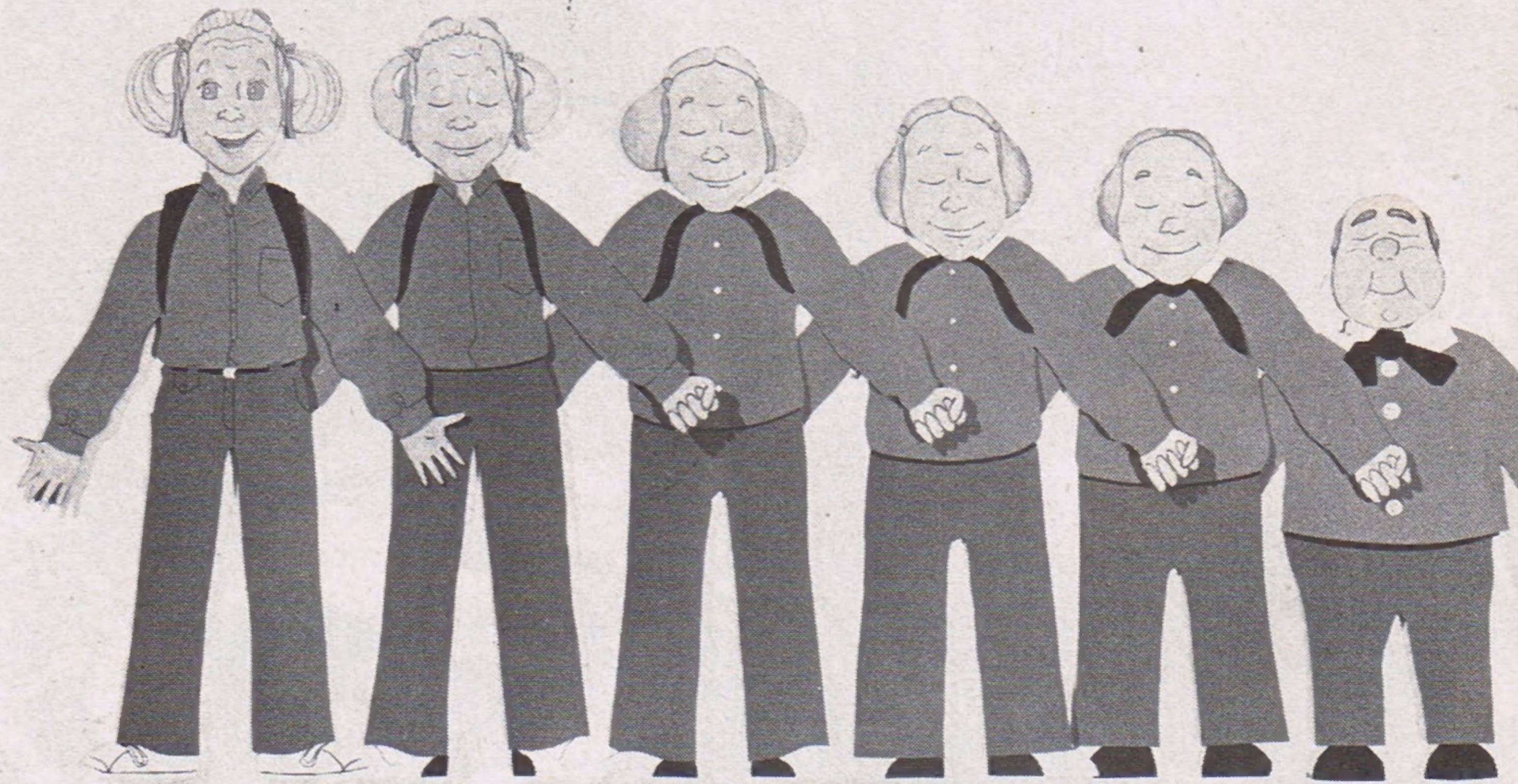
The characters were animated primarily in front of a front-projection screen. The fully-timed, low contrast prints from the 16mm color negative were projected through a slightly modified optical printer, purchased from J-K Camera Engineering in Oakland, California. The optical printer had been selected because of its ability to project one frame at a time with precise registration of each frame. The printer also had a filter slot for the color correction filters necessary in any type of re-photography.

The typical "Shape and Form" scene required that I first fill out a detailed exposure sheet, which told me exactly on which frame to sculpt a certain vowel, change a head or have the character perform a certain action. For example, at frame 103, when a door starts to open for "Alice" (via invisible wire pulled during on location shooting), Form's hand had better be on the door to "push" it open. Next I had to clean the film, put it in the projector and wrestle the projector, camera, and beam splitter to the proper distance from the screen so that Alice's projected image would be the correct size alongside the models of Shape and Form on the animation table top. Once this was accomplished, the table top was adjusted to the correct height and angle. If a miniature floor was necessary to keep the proper perspective, this also was designed and painted. Finally, a piece of front-projection material was cut to fit the contours of the animation stage, so that an instant split screen matte was produced. This made the character seem to stand right in the middle of the floor rather than somewhere below picture cut-off.

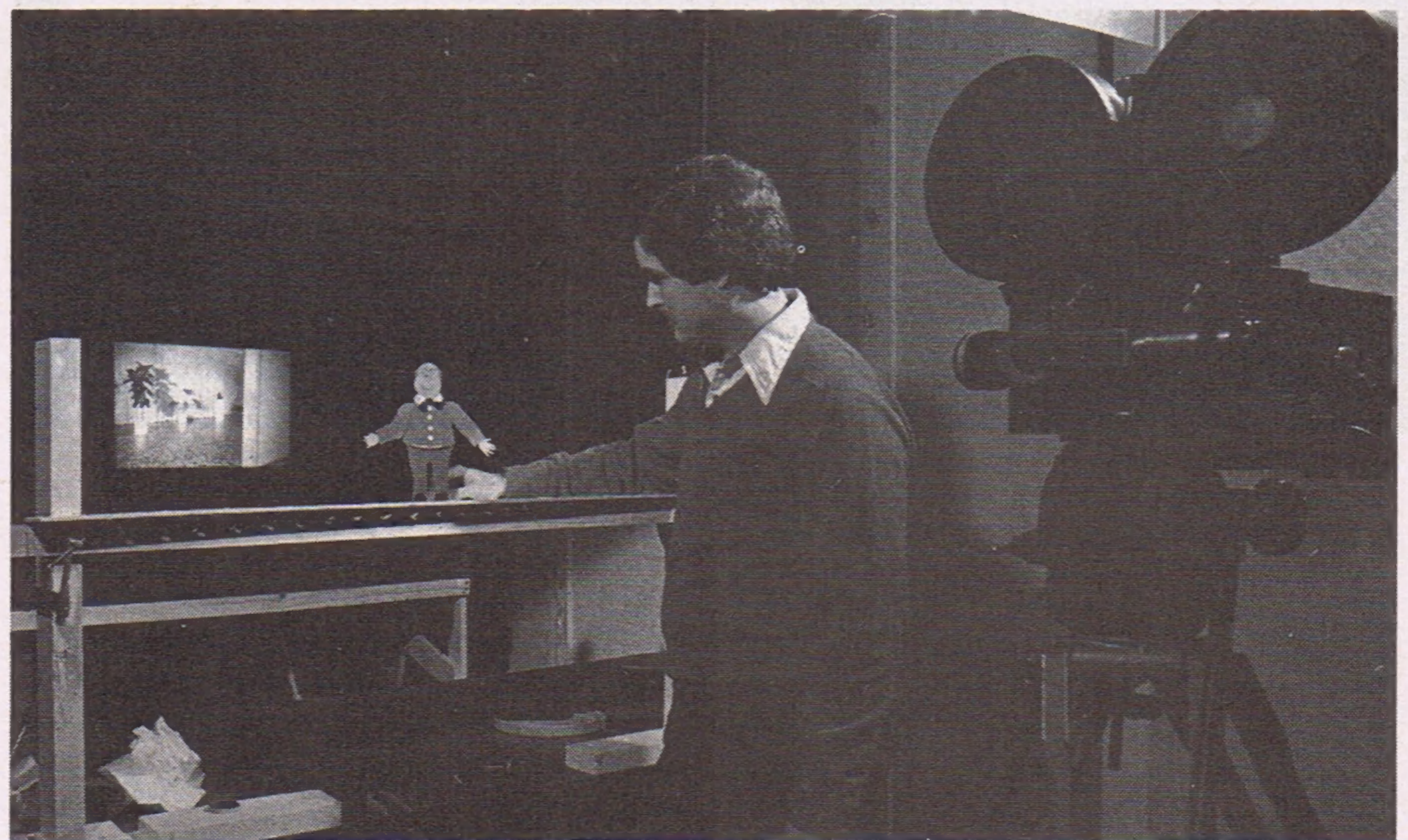
Whenever Alice did not appear in the shot, and the background was static, I used a rear-projected slide behind the characters. I found that rear projection is much easier to work with in many cases



When aligned correctly, Shape and Form appear to be really "in" the live action scene.



Five "in-betweens" transform Shape into Alice.



A simple rear projection setup.

because the camera and projector alignment is not as critical as it is in front projection. I could also switch quickly from one lens to the next whereas, in front projection, one has to stick with the same

focal length lens on both the camera and projector. This allowed me to pick up a few extra shots; such as, close-ups, medium shots, long shots, and other

(continued on page 61)

Showscan Premiere in Dallas:

A PIZZA THE ACTION!

Trumbull's new super format film process is opening in special theaters.

By DAVID HOUSTON



Gerrit Graham, as "Jeremy," the bumbling projectionist, meddles in Mr. Kellar's (Christopher Lee) magic room in the first Showscan film, "New Magic." Many of the exciting electrical effects machines were built by the late Kenneth Strickfadden for the 1931 "Frankenstein."

Douglas Trumbull's revolutionary movie system, Showscan, has at last appeared before a paying public—not in Hollywood or New York, but in Dallas, Texas; not at a grand historic or space-age theater, but at the ShowBiz Pizza Place in the Valley View center.

Considered by many to be the most important advance in cinema since sound, Showscan was first shown privately in 1976. Since then, its inventor, Douglas Trumbull, has been trying to in-

terest moviemakers in his new process. Trumbull is best known for his special effects for *2001: A Space Odyssey*, *Close Encounters of the Third Kind*, *Star Trek the Motion Picture*, *Blade Runner*, and for two special-effects marvels he also directed: *Silent Running* and the recent *Brainstorm*. *Brainstorm*, in fact, was originally written for Showscan, but there were too few places the film could be shown.

A Showscan audience sees an extraordinarily bright 70mm picture that was shot at 65mm utilizing a camera (and

later a matching projector) operating at 60 frames per second rather than the usual 24. This 2½ times normal speed is the crux of the system and the true innovation. As presently exhibited, Showscan also carries with it state-of-the-art advances in sound presentation and theater design, for its first feature, *New Magic*.

Trumbull and one of the stars of *New Magic*, Christopher Lee, were in Dallas for premiere week festivities, as were producer Peter Beale and others representing Trumbull and ShowBiz enterprises. The week included numerous screenings to engender word-of-mouth advertising from the press, college classes in film and communication, Boy Scout troops, a society of magicians, and the like, prior to the official February 9 opening to the public.

Tucked away in a corner of the large pizza restaurant and amusement arcade, the Showscan theater seats only 60 (future installations will seat between 60 and 100). Enter at the edge of the 34-by-17-foot concave seamless screen and select a seat among those in the steep bleachers where the field of vision is 90 per cent filled by the screen (front row) to 60 per cent filled (back row).

Not a whisper of the carnival atmosphere outside enters the acoustically designed black room.

Loudspeakers surround you to convey information from six Dolby tracks on 35mm magnetic tape that is sync'd to the high-speed projector. The dynamic range of zero to 130 decibels (!) includes impulses for sub-audible earthquake and thunder rumblings. The sound was laid in by Sandy Berman (who handled sound effects for *Jaws* and *The Sword and the Sorcerer*) utilizing a 3-D sound grid for discrete placement that permits, for example, the sound of bubbles in underwater sequences literally to swirl around you.

House lights dim. For not-too-subtle comparison, a conventional and badly scratched 16mm movie hits the screen, snags in the film gate, and melts. The "inept projectionist," really the main character of the 22-minute movie, mumbles to himself, enters a room



PHOTO COURTESY OF BRICKTRUMBULL ENTERTAINMENT CORP.

Peter Beale (left), Showscan producer and Douglas Trumbull, Showscan inventor and director, on the set of the first Showscan film, "New Magic."

behind the semi-transparent screen hoping to find a replacement print. He turns on a light or two back there, so you can see him bumbling about.

The projectionist—played by Gerrit Graham of *Phantom of the Paradise* fame—steps to the screen, leans into it, talks directly to the audience ("Are you people still out there?"), and leaves clumsy saggy wrinkles in the screen. You will probably gasp, at least a little, when you realize that not only is there no room back there and no projectionist, but that the screen is not really wrinkled and there are no streaks on the screen from ceiling lights that aren't there either. All of it is a projected movie image—and yes, it is that clear, that free from flicker, grain, motion strobing, and signs of imperfections in individual frames. It isn't 3-D, but you might have to shut one eye to be sure of that.

The Sorcerer's—Apprentice—like story of *New Magic* is not much to rave about (though there are moments of good suspense), but the picture and effects certainly are. This first offering is really just a sampler, a demonstration of what the process is capable of; and as such, not a fraction of any of the 22 minutes is boring. For this observer, the most important discovery about Showscan was this:

It works equally well for intimate dialog and for such dizzying vistas as jet-fast flights over mountains and ocean

waves—for both drama and spectacle. This cannot be said of Showscan's spiritual relatives: Cinerama, the three-screen original, showed conversationalists that looked skyscraper tall and miles apart; Imax and Omnimax, domed and flat versions, present close-ups that either are bowl-shaped or so huge one must turn one's head to look from one eye to the other. The depth of field in Showscan can place everything in focus from a foot or two to infinity; combine that fact with the outstanding clarity and the proportions of the screen, and the result is surprisingly like that of live theater. An intimate scene can transpire among people photographed right at the picture plane who are not much larger than real people would be at that distance from the viewer. Even a full-screen close-up is of manageable proportions for the eye.

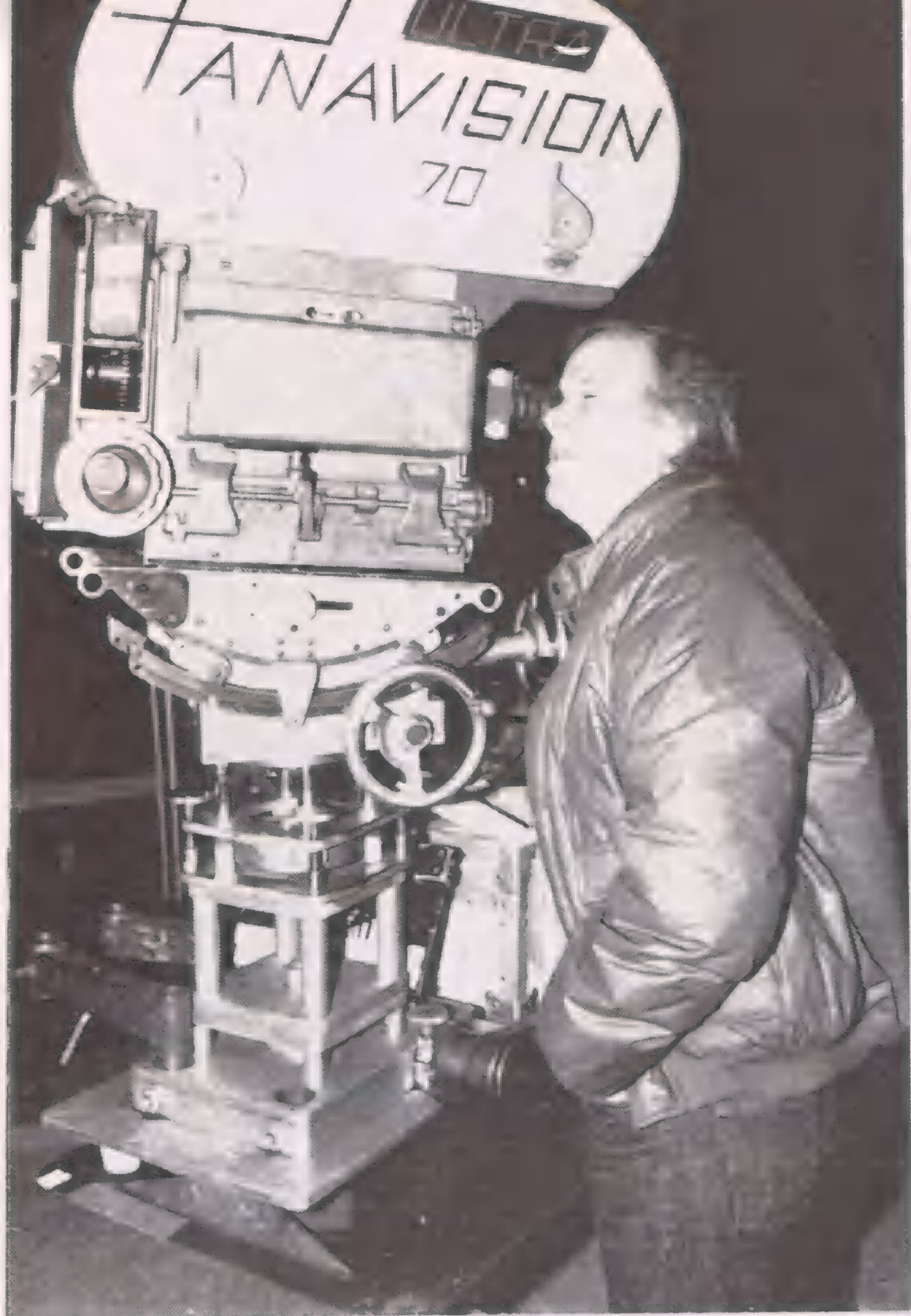
Christopher Lee said he believed that this was, indeed, the film process of the future; and he reflected the sentiments of Trumbull and the other hopeful creators of Showscan. They might be right. Strange as it seems to seek out such an innovation at a pizza parlor, run, do not walk, to your nearest one. The first four ShowBiz Showscan SuperCinemas are in Dallas; Springfield, Missouri; Huntsville, Alabama; and Fairfax, Virginia. One hundred and fifty more are expected to be in operation nationwide by this time next year.

By then other Showscan features will be circulating among them. A trailer was shown in Dallas for the second feature, *Big Ball*—a sort of dune-buggy demolition derby with swooping chases and a beat-the-bad-guys plot. Other 22-minute movies are planned, including a serial of a number of 22-minute chapters, each of which would be shown for about 6 weeks.

In interviews, the principal creators and participants talked excitedly about their work:

"We talked with physiologists who study human perception," said Trumbull, "and we studied 3-D and stereoscopic viewing as a function of three-dimensionality. We discovered that stereoscopic vision—using both eyes to perceive depth—is only dominant to about 10 feet from your body. Beyond that, which is the whole rest of the world, a wide range of factors come into play, things like perspective convergence, velocities, objects changing size in space, objects moving in relation to other objects. We use all of these visual clues to construct our three-dimensional model of the world. Because the Showscan image is so sharp and clear, viewers subconsciously construct the same model for the screen image. The result is a powerful feeling that the surface of the screen has vanished and you're looking into a very deep world."

Trumbull said that Showscan has



Showscan inventor, Douglas Trumbull, looks through the eye piece of Showscan's specially modified Panavision 70 camera. Showscan operates at 60 frames per second instead of the usual 24.

changed the way he directs movies. "Even very basic things like the 'over-the-shoulder' shot, for instance. It's always been one of the most common set-ups for conventional films, because it makes the viewer feel like he's listening in, like he's part of the experience. In Showscan, looking over an actor's shoulder makes

Douglas Trumbull with his Showscan display board. The super format process is currently operating in five ShowBiz Pizza Theaters and will be expanding to about 150 locations across the country.

SHOWSCAN™



PHOTO: DAVID HUTCHISON

the viewer feel like he's being left out. Perhaps it's because the audience already feels involved, so why aren't they being included. It's more of a live theater approach, where the actors play to the audience, or, in this case, to the camera.

"The Showscan camera sees everything. That means that makeup has to be more thorough and refined. An actor's style can be more subtle, but at the same time, the camera sees every flaw; so it's a real acid test of his performance."

Actor Christopher Lee—the famous Hammer horror artist—is only on screen for a few minutes, but from his one day on the set he learned what Trumbull was talking about. "Everything is in focus," said Lee. "that makes your work, every aspect of it, very visible. But there's also a new element of freedom: your movements are not so critical and mechanical; you don't have to worry about staying behind chalked lines to remain in focus.

"The hardest thing for an actor to do is to take something the audience knows for a fact can't happen and create the suspension of disbelief that makes it credible. Showscan is a big help in that regard, because it makes the audience feel like it is a part of what is on the screen."

Lee said that the Showscan problem of noise from the high-speed camera has been largely licked. "Only the extreme close-ups have to be rerecorded," he said. There is one such close shot of Lee, in which the audience can see every pore and even the lines in the iris of his eyes.

Lee still maintains, incidentally, that his best work is in *The Wicker Man*; but now he adds his comedy role in *Serial* to his list of recent favorites.

New Magic star Gerrit Graham—most recently seen in *Demon Seed* and *Used Cars*—agrees with Lee's estimate of the Showscan acting experience. "The image is so very clear," Graham said, "you have to pay attention to every miniscule detail of your performance. In 70mm on a 34-foot screen, every flicker of an eyelash shows up much more than with what I now think of as 'old-fashioned' films.

"It changes the way I put on my makeup. Every surface has to be covered, even the insides of my ears. And for a male actor, eyeliner or eye shadow may be a thing of the past. On the Showscan screen, it looks like a guy wearing makeup."

Graham predicts that Showscan will affect acting styles. "The style will probably become more refined and precise. The same thing happened with the advent of talkies when it was no longer necessary to project a performance in broad melodramatic strokes. There could be other changes as well, lighting, the way you hide the mike on the actor's clothes, even costuming. Before every shot, I had to be brushed with a lint brush, because it showed up on film."

Sound effects man Sandy Berman discussed his work for *New Magic*. "When you say 'sound effects' to most people, they think it's something you get off a record, or else electronically produce. But nothing could be further from the truth. Almost all of the sounds I use are originally produced, and I prefer 'organic' sound to the electronically produced kind. The robots in *New Magic* are a good example. We wanted to make the robots sound almost human, but somewhat electronic at the same time."

To do this, Berman used an audio-digital device that takes the sound of a real voice and processes it to produce a series of vibrations. "I can control the pitch and compress or expand the sound to get exactly the voice I want."

For earthquake sounds, Berman used a digitized recording made from seismograph impulses borrowed from the University of Southern California at Berkeley. "As far as I know, no one has ever used a real earthquake as the basis for the effect."

Showscan underwater photographer J. Barry Herron supplied data on his contribution to *New Magic*. "I have shot in Imax and Omnimax, large format filming, but nothing I have seen can match the quality and flexibility of Showscan. With our new camera housing we have underwater capability equal to conventional 35mm shooting but with far better results. Using Eastman Kodak's new emulsion 5294 (ASA 400) film, Showscan makes the moviegoing audience feel as if they are actually underwater."

Creative assistant Ann Vidor is looking for story ideas for future Showscan presentations. "One of the major areas we're looking at is the spectacular experience," she said. "Things that people may only dream of doing in their lifetime but may never have the chance to experience—soaring in a glider, skiing off a ski jump, sailing in 12-foot seas or exploring underwater. We're looking particularly for those experiences that give the audience a sense of exhilaration.

"Another area is Showscan versions of shows and events. A circus, for example. Personally, I would like to see the world of dance shown in Showscan. It's a fabulous world that's never been shown to full advantage on film of any kind. And there is great interest from audiences and performers alike to see Showscan mini-concerts with major recording artists. And then there is the inevitable space adventure with spectacular visual effects which audiences seek today—the 21st Century frontier stories.

"We're pushing our own frontiers of filmmaking with the Showscan process—really breaking new ground, and this attracts ideas from the industry's most creative people. But the real 'proof of the pudding' for what the first Showscan films will be like is what our audiences tell us they want to see." CM

CAREERS

Jim Danforth

A tale of cinematic survival.

By JOHN DODS

The dinosaur looked real. It didn't move with the pops and jerks typical of animation models or with the stylized high-energy theatricality of a Ray Harryhausen creation. The movement was fluid and smooth, the staging subtle and realistic. The creature looked alive; it drew breath and walked with the slow-motion gracefulness of a big cat. Its thickly textured skin wrinkled and flexed as it moved through the pre-historic landscape—eyelids blinking. The illusion was superb but apparently impossible, for how could stop-motion animation—a supposedly unrealistic and “flawed” technique—look so good? But the dinosaur looked real.

The scene was from Hammer Film's production of *When Dinosaurs Ruled the Earth*, in which the mother dinosaur made her dramatic first appearance. The remarkable effects in this little-seen British movie were created by Jim Danforth, who set a new standard for realism in dimensional animation with his work on this film. Not until the development of the “Go-Motion” system and the production of *Dragonslayer* would animated movie-monsters look this convincing again.

Danforth's Oscar-nominated special effects work on *When Dinosaurs Ruled the Earth* is just one highlight of his multifaceted career in filmmaking but it typifies the meticulous approach, realistic style, and faultless execution that characterizes his work. His 26-year-old career includes contributions to dozens of distinguished motion picture and television productions. Jim Danforth is one of Hollywood's busiest matte artists. His paintings have appeared in such films as *Conan*, *The Thing*, *Creepshow*, *The Twilight Zone* and *Megaforce* and in TV productions such as *Tales of the Gold Monkey*, *Bring 'Em Back Alive*, *Salvage One*, *Movieola* and *The Blue and the Grey*. His stop-motion work has been seen in *The Wonderful World of the Brothers Grimm*, *Flesh Gordon*, *Jack the Giant Killer*, *It's a Mad Mad Mad Mad World*, and *Clash of the Titans*; on TV in the *Davey and Goliath* series, in early



Jim Danforth, 1980, shooting VistaVision background plates for *Caveman* in Durango, Mexico.

(continued on page 20)

The Art of Stop-Motion Animation

By DOUGLAS BORTON

It moves . . . it walks! But is it truly alive?



Harryhausen animates the evil sorcerer's dragon in *The Seventh Voyage of Sinbad* (1958).

Three-dimensional animation, as a craft, requires a thorough grounding in the basic principles of movement (some of which were discussed in my article "Model Behavior," CINEMAGIC #24). But animation at its best is not merely a craft; it goes beyond technical competence and becomes something more. The animator takes a foam and metal object, makes minute adjustments in its position—and creates a performance. He puts himself in the model, giving it a mind and soul. He brings statues to life. This unique blend of sculpture and theatre raises stop-motion to the level of a true art form—an art form which was born with the motion picture and which, like film itself, has yet to reach its full potential.

Today's young animators are the ones who will continue the development of this new art. And as you do, there are a few simple pointers you may wish to keep in mind—pointers which can make the difference between craftsmanship and art in stop-motion animation.

Lifelike Action

Every kind of animal has its own special way of moving, dictated by its anatomy, size and weight. A long-limbed animal tends to be either graceful and delicate, like the gazelle, or awkward and hesitant, like the giraffe, colt and baby deer. A creature with short, stubby limbs, such as a rhinoceros, just plods along. Small, light-weight animals like squirrels dart from place to place, making quick, skittish movements; big, heavy animals like elephants are ponderous, deliberate and slow to react.

The best training ground for an animator, outside of his workshop, is the zoo; and the best textbook for an animator, besides CINEMAGIC, is *Animals in Motion* by Eadweard Muybridge (Dover Publications: 1957). Muybridge was a photographer who pioneered the study of animal movement and left us thousands of still photos illustrating every kind of action, from birds in flight to galloping horses to parading elephants. Look up the book at a library and study the photo sequences; sketch or trace the most useful ones. Then visit the zoo and watch actual animals go through the same movements. You may even wish to film the animals and study the film frame by frame on an editor-viewer.

Your job as an animator is to create motion which is not merely smooth but *lifelike*; and as with all the arts, constant study and observation are the only ways to find out what life is like.

Complexity of Movement

Although it is important to understand animal movement, no animator can reproduce real life with total accuracy. In fact, you shouldn't even try. In real life,



Production artwork for the classic battle in *King Kong*.



Production composite still of the above sequence in *King Kong*.

animals and people make many small, unnecessary movements which would only be distracting on the screen. Good actors are aware of this; they train themselves to avoid such irrelevant gestures and mannerisms and to move more surely and gracefully than would be "natural." This gives added power and impact to the gestures they *do* make.

Any performance, whether of a live actor or an animated model, must be *stylized*—streamlined—to be effective. But if you simplify action too much, the results will be boring, mechanical, artificial. The essence of stylization in animation is to reduce action to its bare essentials, omitting anything which is distracting or irrelevant—while still maintaining that all-important illusion of life.

Imagine a scene involving a dinosaur—say, an allosaurus. The creature walks smoothly in a standard "walk cycle." The tail drags along on the ground. The head perhaps turns this way and that and registers some reaction. It's all very competent—but it's no more than competent.

Now recall the allosaurus in Ray Harryhausen's *One Million Years B.C.* The animation in this sequence is far more than competent; in fact, it may be Harryhausen's best. The difference is that *this* allosaurus is not merely in motion, it is *alive*. The creature never stands still; even when not walking, it takes short steps forward and back or from side to side, like a boxer in the ring. The long tail never drags on the ground; it whips and



Cyclops and dragon battle to the death in Harryhausen's *The Seventh Voyage of Sinbad*.

writhes in the air, counterbalancing the weight of the body. The head does not merely turn or register occasional reactions; it reacts to everything, ducking, snapping, snarling, lunging and recoiling. Even the small forearms grasp and twist and claw with savage fury. And all of these actions are carefully calculated to add to the total effect of a ravenous, rampaging beast; all are integrated into a smooth, continuous *flow* of action. The result is totally stylized; no *real* dinosaur ever moved like that. And yet it is chillingly realistic—because this is the way that particular dinosaur *ought* to have moved. Animation such as this requires extra effort, but it yields extra-special results.

Animation need not be dynamic or violent to be complex, however. Very often the subtlest movements are the hardest to achieve. Consider the scene in Jim Danforth's *When Dinosaurs Ruled the Earth*, where the mother dinosaur discovers her hatched egg. The model seemingly does very little in this sequence; it just stands there. Or does it? Look closer and you will see the creature blink, swallow, lash its tongue, inhale and

exhale, shift its weight, curl its tail . . . all while “doing nothing.” Such incredibly subtle, painstaking details combine to create the overpowering impression of a living creature on the screen.

Drama and Emotion

There is a saying among musicians: music can be good, bad or indifferent—and the indifferent is the worst. Their point is that technical excellence by itself is not enough to make a musical performance really great; the musician, having mastered technique, must go *beyond* technique to put his moods, his longings, his *feelings* into the music and bring it to life.

The same holds true for all the arts. Painters and sculptors feel the agony or triumph of the figures they create. Writers identify with their characters almost as alter egos. Actors, before going on stage, put themselves “in character” by recalling some deeply personal event in their own lives which corresponds to the situation in the play. In every case, the crucial thing is to set free the appropriate emotions; like Luke Skywalker in *Star*

Wars, the artist must learn to “trust his feelings”—with certain limits.

Stop-motion is an exacting discipline which may seem to leave little room for feelings. And it's true that your feelings can tell you nothing about the purely technical side of animation. They can't tell you, for instance, how to map out a “run cycle.” But they can tell you *why* the creature is running in the first place. How would *you* feel if you were the creature? Would you be angry . . . confused . . . frightened? Would you stride forward boldly or race along in short, nervous hops or waddle in terror, half-stumbling as you go? Would you stare ahead, licking your chops in confident anticipation of your next meal or look around, blinking and scratching your head or glance back over your shoulder, wide-eyed with fear? The basic run cycle—the technique—may be the same in all three cases, but the personality it conveys—the emotion—will be quite different. And if you keep that emotion in mind while you're preparing the scene—and above all, *while you're animating*—that emotion will come through in the results.

The range of emotions displayed by an animated figure varies widely and depends ultimately on the needs of the story. King Kong, who as David Allen once remarked is the film's real protagonist, is alternately tender, enraged, gallant, jealous, puzzled, resourceful, playful, even stoic. Harryhausen's Cyclops, as only one creature among many encountered by the story's hero, is drawn in simpler but no less memorable terms: a hostile, possessive hermit who gloats over hoarded treasure and gleefully smacks his lips while roasting human victims alive. Less humanoid figures are harder to develop, but even birds, turtles and alligators can exhibit *some* personality traits. An alligator, for instance, may be slow-witted and sluggish, but with a nasty temper once aroused . . . or voracious and quick, with deadly snapping jaws . . . or sinuous and sly, slowly creeping toward its victim . . . or . . .

Get the idea? *Anything* in animation can display emotions. An ashtray, a fork, a soda bottle, a wastebasket can become a *character* in your film. But before an inanimate object can be made to “feel” anything, *you* must feel it. This is the most nebulous aspect of animation, the hardest to explain—and probably the most important.

First-rate animation, then, means more than just putting the model through its paces; it means putting life, drama and emotion on screen. Mastering this new art is a lifelong process, which only a handful of experts have had the dedication, sensitivity and skill to complete. Naturally, you can't expect to outclass the pros the first time around. But if you understand the basics of your craft and then work to create complex, lifelike and dramatic action, you'll be well on your way.

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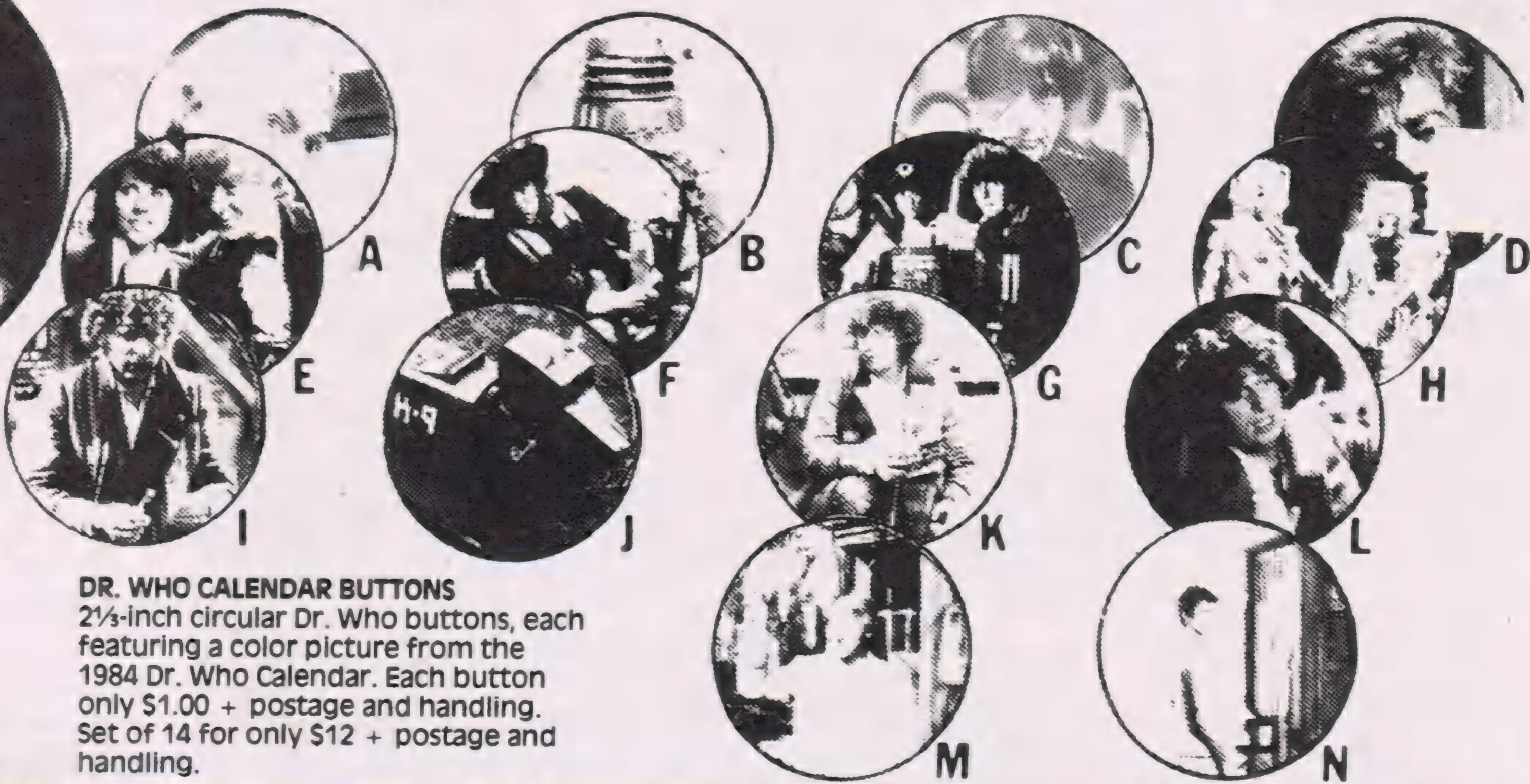
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Sundae in New York

New York animator Jimmy Picker won an Oscar for his clay-animated short.



PHOTO COURTESY OF JIMMY PICKER

By JOHN CLAYTON

Animator Jimmy Picker gained national recognition recently when he won the Academy of Motion Picture Arts and Sciences' coveted Oscar for Best Animated Short Subject with his three-minute clay-animated film, *Sundae in New York*. This film has established Jimmy Picker's reputation on a national level, but before all of the hoopla over his smash film and his Oscar he was a well-known member of the New York animation community.

Sundae in New York depicts the city's famous Mayor Ed Koch in an appealing and amusing musical comedy sketch singing the nationally recognizable tune, "New York, New York." What makes the film special for New Yorkers is that clay caricatures of many other local politicians make cameo appearances and the film allows New Yorkers to laugh at themselves as it makes comical situations out of their everyday concerns. Even the problem of crime can be turned into a joke when a clay Mayor Koch sings a show tune to a subway train full of mean thugs—one wearing a T-shirt that says "Mutha" and another openly carrying a knife in his mouth. Of course the cleverness of the animation—the little sight gags and funny situations—are what gives the film its real appeal. If you're a New Yorker, you'll understand and appreciate all of the in-jokes, but

even if you're from Craters of the Moon, Idaho, you'll be able to enjoy the extremely fine clay animation and Picker's sense of humor.

Sundae in New York is not Picker's first film to feature a clay caricature of a famous politician in a musical comedy sketch. His previous film *Jimmy the C*, featured former President Jimmy Carter singing "Georgia on My Mind" in the oval office (a Ray Charles recording provided the soundtrack). Picker also worked with animator Peter Wallach on a film entitled *Reagan's Rap*, which featured President Ronald Reagan singing a "rap" song.

"After doing *Jimmy the C*, I began searching for another idea worthy of the clay medium and I came up with the idea of having Mayor Koch sing "New York, New York," Jimmy Picker begins. "I really liked the combination so I spent about a year making the film—doing virtually everything except the voice and music myself. I did a few commercial jobs on the side during the time I was making *Sundae in New York*, but I spent most of my time working on the film.

"It took me about a month to design the Koch head and about two months to get the opening sequence together—storyboarding, analysing the soundtrack and fabricating all of the clay

Above: A clay Mayor Ed Koch of New York City is surrounded by thugs on a subway train.

characters and props myself. Once everything was prepared, it took me a few days to shoot the opening sequence and that gave me about 30 seconds 'in the can.' After I had shot the opening sequence, I spent the next three months fabricating all of the clay characters and props for most of the rest of the film. I went ahead and shot another minute or so of animation and then stopped for about a month to fabricate more characters."

There are about sixty characters in the film, so there was a lot of sculpting to do. The characters are made of oil-based plasticene. About eight of the characters in the film are caricatures of famous celebrities: *Mad* magazine mascot Alfred E. Newman, talk-show host David Letterman (who delivers a pizza), comedian Rodney Dangerfield, Frank Sinatra, the late Russian leader Yuri Andropov, New York Governor Mario Cuomo, New York City politician Carol Belamy, and a few others. Picker added an extra flair of New York ambiance by having a pair of cops in the film portrayed by officers Tootie and Muldune from the 20-year-old TV comedy show *Car 54 Where Are You*.

"I used photos for reference when I was fabricating the recognizable celebrity characters because you want to use as much reference as possible to create a

good caricature," Picker continues. "I had a mold made of Koch's head so I could keep making fresh Koch heads during the course of the production. No matter how careful you are and how clean your hands are, a character starts to get a 'five o'clock shadow' by the end of a scene from being handled so much during the animation.

"Since Koch was the only character in all the scenes, his was the only head that had to be molded to make new heads for each scene. I just packed my mold with clay to make a fresh Koch head. I made a few plaster casts from the Koch head mold and used them as wig stands to hold the various different hairpieces and eyebrows I used to animate Koch in the film. I used baked Sculpey for things like hair pieces, eyebrows and props. Using baked Sculpey for fabricating props and miniature set pieces is a good idea because it is more durable and gives the animator something to hold onto.

"Probably the most important thing to do in clay animation is to keep the characters cool," Picker reveals. To illustrate this point Picker opens his refrigerator which contains dozens of clay characters—leaving hardly any room for food. "The clay would get too soft under the hot lights when I was shooting, so I keep an air conditioner going and I have a fan hooked up to a tube which blows air close to the characters to keep them cool. If you try clay animation without keeping the characters cool and solid, you'll just make it hard for yourself.

"I don't use any armatures in my clay animation technique," Picker explains. "An armature would just cause problems by poking through the clay and then you'd have to take the time to resculpt. If I happen to have a character with a long neck or if a character is looking down and creating a weight problem with the head, I'll fudge it by putting something like a big fishing hook in the back of the character's neck to hold the head up. What ever is easiest and works for a particular situation is the method I use.

"One other tip I'd like to share with young animators who are starting out is to choose a *short* project rather than a long epic or you'll never get it done," Picker suggests. "You can also put more quality into a short film than you can put into a longer one, so the end result will be more impressive. It's also easier to get a short animated film distributed. If my film had been six minutes instead of three, it would have been too long for most theaters to run as a short.

"One technique that I put extra effort into while I was making *Sundae in New York* was animated camera movement. A moving camera adds a whole new dimension to animation and makes it seem more lively. That's one example of putting more quality into a short piece of

(continued on page 42)



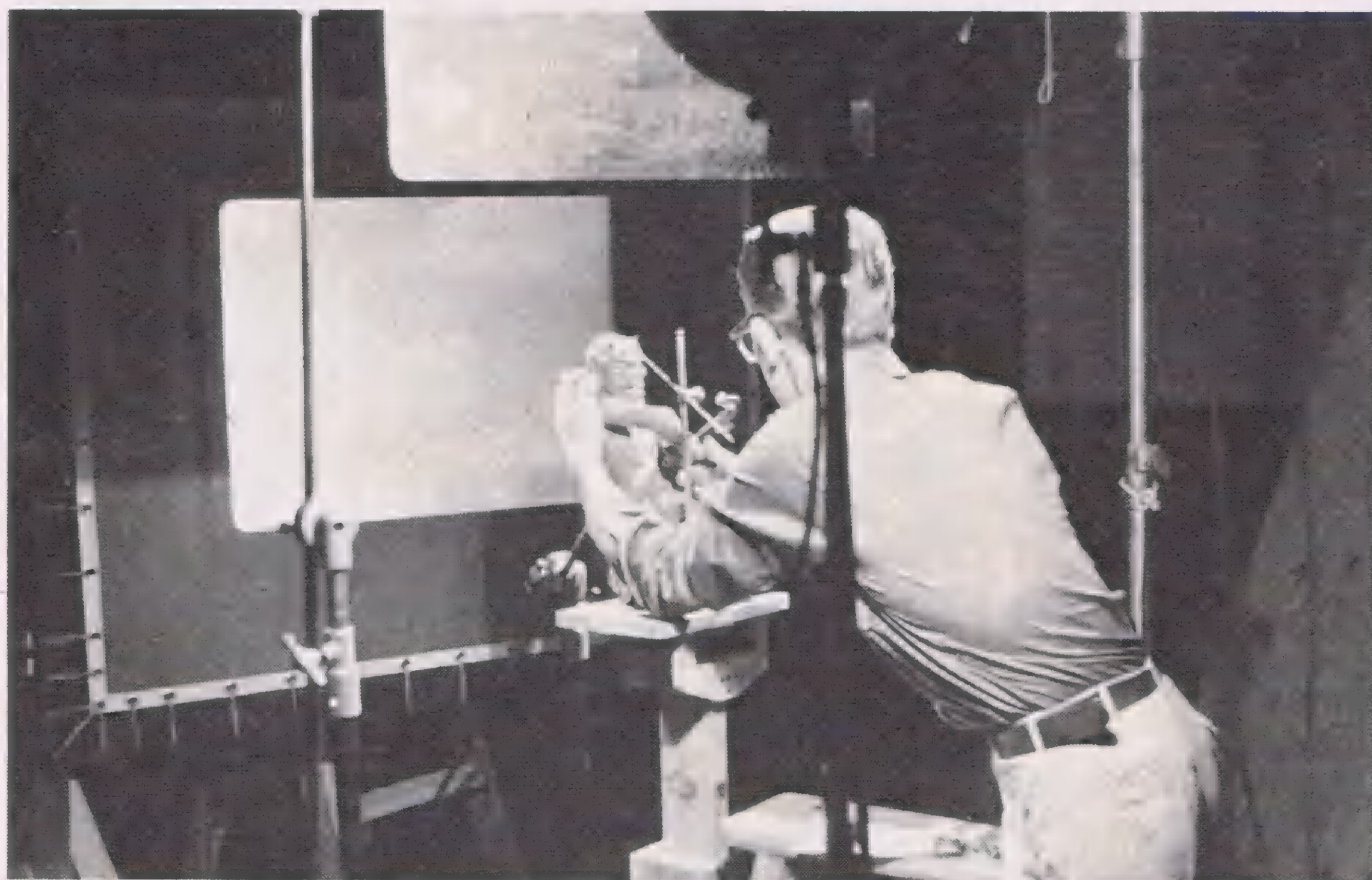
Picker's refrigerator is filled with his wonderful clay characters, leaving hardly any room for food. Picker keeps his characters cold to keep them from getting too soft.



Jimmy Picker takes a moment out from animating to pose with his animation camera at his Motionpicker Studios in Brooklyn, New York. Picker won an Oscar for *Sundae in New York*.



Jim Danforth leans over a rock miniature animating the tentacled sea monster from *Jack the Giant Killer* (1962). Note rear projection screen in the background. Danforth felt that this was one of his most challenging projects because it came so early in his career.



Jim Danforth animating the two-headed giant (Galligantua) from "Jack the Giant Killer."

Danforth

(continued from page 13)

Pillsbury Dough Boy, Nestles Man, Bob's Big Boy, and Armorall TV commercials and in the introduction to *The 7 Faces of Dr. Lao* (Danforth received an Oscar nomination for his stop-motion work on this film), *Caveman*, and the remarkable *When Dinosaurs Ruled the Earth*, a film in which Danforth designed and supervised all of the effects work. Most recently Danforth completed five matte paintings for Warner Brother's big-budget fantasy *Never Ending Story* and is currently finishing the mattes and related effects work on *Ninja 3*.

Jim Danforth's prolific career has been the subject of numerous articles and interviews in such magazines as *Photon* #25, and *Fantascene*, Vol.1 #2. I refer interested readers to these magazines and to the Jim Danforth bibliography that

will appear at the end of this series since I will not be covering areas of Danforth's career and thinking that have been well documented elsewhere.

During eight hours of interviews with Danforth I learned how he got started in the film business at the age of 18, and heard his searing appraisals of film unions, the Academy of Motion Picture Arts and Sciences, and the politics of filmmaking. We discussed his thoughts on the works of Ray Harryhausen and why he fears that filmmaking's most famous effects practitioner will never receive another Oscar.

Most importantly, we explored the secrets of his craft and discovered why a man who calls stop-motion animation "an unrealistic technique" has refined it to the point of breathtaking naturalism.

Cleveland to Hollywood

Jim Danforth was born in 1940 in an outskirts of Cleveland, Ohio. "I grew up in Illinois," Danforth recalls, "We moved there when I was about four or five. I started making films when I was 12. The first film I made was shot on a roll of outdated regular-8 film. It was a marionette version of *Winnie the Pooh* with my little brother as Christopher Robin. We had an old teddy bear kicking around the house; I put strings on it and stitched a *Piglet*. Then we went out into the backyard and filmed a sequence." The end of the roll featured an animated cowboy and rattlesnake made out of pipe cleaners; "It was pretty bad," says Danforth, "but I did it. It was exciting enough so that I wanted to do more."

Danforth's father was a college professor of biological sciences. "It was very nice," remembers Danforth, "he had a lot of paleontology books around. My father was able to answer just about any question I came up with and pointed out how different animals are articulated and how every vertebrate really has the same skeleton—it's just the manner in which the bones are elongated or compressed that varies."

Danforth first saw the legendary *King Kong* when he was 12 years old during its second theatrical reissue. He says, "I went not knowing too much about it—expecting that I was going to see this giant gorilla that appeared in the TV ads. I was just blown off my feet when it was preceded by the explorers encountering dinosaurs on Kong's island. That made a *big* impression on me!" Danforth also mentions Alexander Korda's production of *The Thief of Bagdad* and the action-adventures *Lives of a Bengal Lancer*, and *Beau Geste* as films that affected him greatly. Perhaps surprisingly, he says, "*Beau Geste* probably impressed me far more than *King Kong* ever did."

Danforth's early filmmaking efforts continued with another film made with friends. In it a spaceship crashes on a planet inhabited by a pteranodon and a tyrannosaurus rex. The pteranodon was a puppet made of balsa wood and tin foil. The tyrannosaurus was a four or five-inch tall animated clay model. "I remember trying some shots with a salamander captured from a nearby creek," remembers Danforth, "But I didn't like that much so I continued with my clay animations." In the film, the youthful spacemen zapped the tyrannosaurus with their ray guns—an effect the young Danforth created by scratching beams onto the film. Soon his technical experiments were becoming more ambitious.

"I was getting anxious to get a better camera. I had tried to do bi-pack traveling mattes in the regular-8 camera; it didn't work at all." Furthermore, he wanted to get a camera with a single-frame shaft. His animation had to be

PHOTOS: 1986 JIM DANFORTH

recorded by pulling on the camera trigger in short jerks which sometimes resulted in multiple frame exposures. But a better camera would have to wait.

At the age of 15 Jim collaborated with two friends to produce *Snag of Time*. In it travelers journey backwards in time to study the Incas. But they encounter a snag in time and find themselves in the Mesozoic age and a land full of dinosaurs. "The models were terrible" says Danforth, "But we did some slightly more elaborate composites. They let us shoot in the Arboretum in Arcadia which is where some of the 30's *Tarzan* movies were shot. I did a double exposure with an albino brontosaurus swimming through a lagoon; there were people in the foreground pointing at it. We had model pteranodons on strings enlarged through forced perspective; the actors would look away into the distance and point. The models were really closer to the camera than the people were so that they would look enormous.

"I was 17 when I finally bought a 16mm Bolex camera. I had been having an ongoing battle with my parents, who were trying to force me to take up a musical instrument. I said 'I don't want an instrument, but I sure want a movie camera!' When they refused to buy me the camera I got a summer job working for my cousin and saved up enough money to buy the camera."

Acquiring a good camera was part of what Danforth describes as his drive "to make things better." He recalls his reaction to the first roll of film he shot on his new Bolex. "I was ecstatic! It was wonderful! It was sharp, it was clear, and it only took *one frame* when you pushed the single-frame button," he remembers, laughing.

Danforth describes a shot he recorded with his new possession: "I built an allosaurus model on a wire armature with clipped foam rubber glued onto it and modeled a very detailed rubber skin over that. I recreated the scene from Conan Doyle's *Lost World* in which the explorers are camped and they have built a protective thorn wall around the campfire. As they're sitting in front of the campfire the allosaurus is trying to get in. I animated the allosaurus trying to tear his way through a miniature thorn wall I had built out of lichen and things. Then I went out into the front yard and stood my brother in front of the biggest bush I could find out there. I shot him in the correct positioning, then backwound and double exposed that into the previously photographed animated footage. I missed on the exposure, but it *wasn't* jumping all over the place. The registration was good. That was very encouraging. Danforth calls the Bolex cameras "Marvelous! Incredibly steady for a camera that does not have registration pins."

Danforth began to work on an elaborate live-action film at the same



Clay prototype giant sculpted by Jim Danforth when bidding on the sculpting for *Jack the Giant Killer*. The design was not used.

time he was continuing his special effects experiments. *Geraldine in Jeopardy* was a black and white send-up of silent movie serials like *The Hazards of Helen*, and *Perils of Pauline*. It featured friends and members of Glendale High School where Danforth was in attendance. To give *Geraldine* the look of an old silent movie he scratched the film, dragged it over pencils on rewinds, and used other abrasive substances to make it look old.

Danforth recalls this period of his life.

"I was kind of the 'runt' of the high school class—not necessarily in size—but just this sort of backwards kid, the brunt of all the jokes. Everybody else had a car—souped up Oldsmobiles and Chevys. I was still peddling my bicycle around delivering newspapers to finance my film experiments.

"There was a valuable life-lesson that came out of *Geraldine in Jeopardy*, something that I did not pick up on at the time. When I made the decision not to go on with the film all of the people who were in it came to me and said, 'No! We want to finish it and we will give you the money! I had this sort of Puritan work-ethic-guilt-trip and I said 'Oh no, I couldn't do that, that wouldn't be right!' I was learning something very important there but I didn't learn it soon enough to

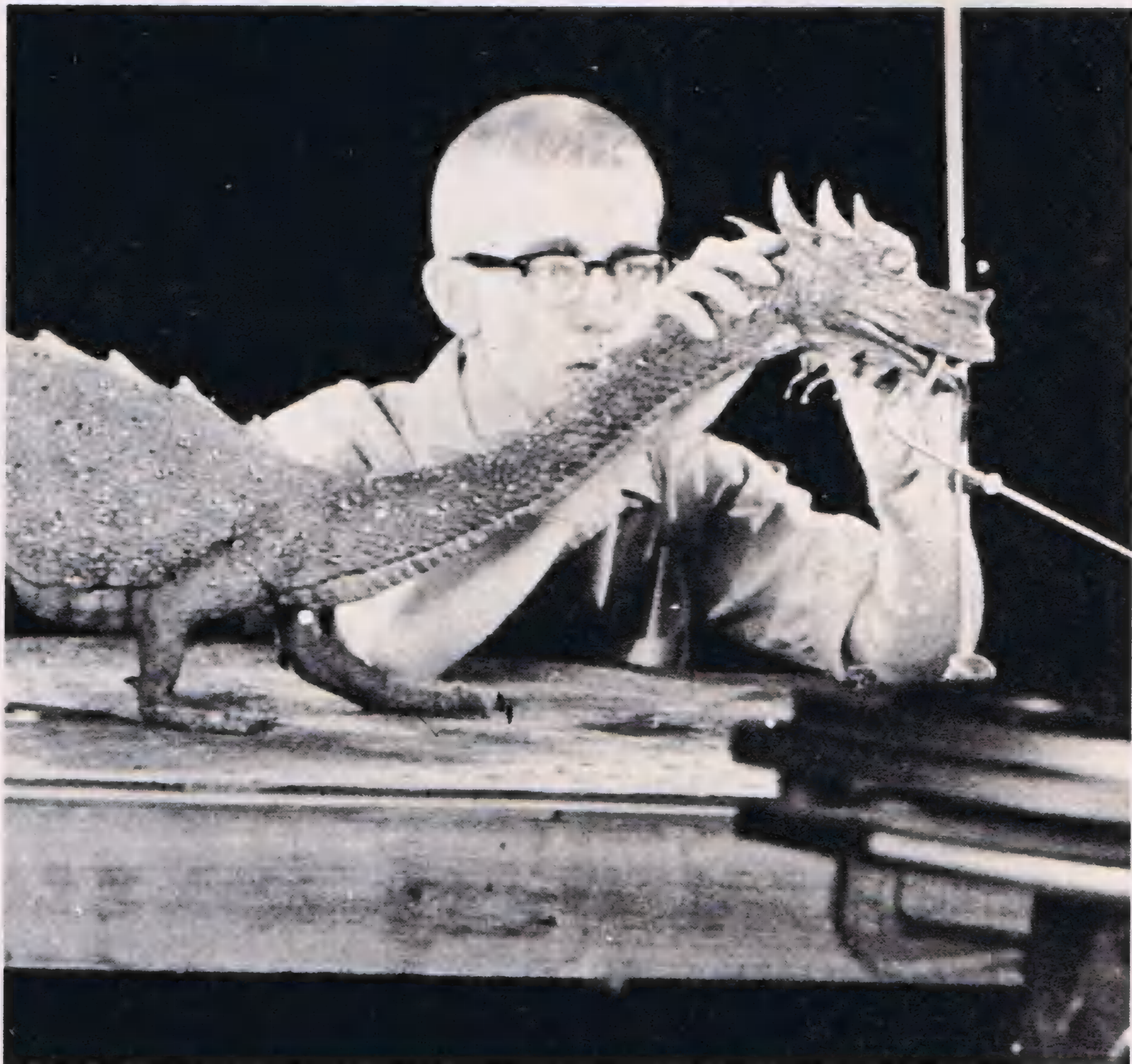
save *Geraldine*. People want to do this sort of thing and may be willing to work for little or no money or be profit participants and kick-in if it's a project that really interests them. But that didn't sink in at the time so *Geraldine in Jeopardy* was never completed." Better news was around the corner.

Upon graduation from high school Danforth tried to find work in filmmaking. He had been encouraged by *Gumby* and *Davey and Goliath* producer Art Clokey earlier that year but when summer came, "he didn't really have anything that he could pay me to do" recalls Danforth. Danforth made the rounds. "I had my demo reel to show that at least I had been practicing my craft and that I wasn't just a dreamer." Still unemployed, Danforth received an unexpected phone call. "It was Art Clokey. He said, 'Jim, if you would be willing to come in here and get some work experience and help me out with some things I'm trying to get going, I will pay you, but I won't be able to pay you what I'd hoped to pay you.'" So at a salary of \$60.00 a week Jim Danforth began his professional filmmaking career.

Soon thereafter Danforth had to make a major decision. Should he continue working with Clokey Productions or



The dragon from *The Wonderful World of the Brothers Grimm* (1962) designed by Wah Chang and Bill Brace.



Jim Danforth animates the jeweled dragon from the Cinerama production of *The Wonderful World of the Brothers Grimm* (1962).

PHOTOS: 1984 JIM DANFORTH

begin classes at U.S.C., where he had been accepted for enrollment in the fall of 1958? Clokey's editor Woody Smith, a former U.S.C. student, advised Danforth, "Look, as far as a liberal arts education is concerned anybody can always use one and that's fine, but, if you think you're going to film school to learn anything about visual-effects filmmaking you can forget it. You already know it!" Danforth stayed at Clokey's. "It turned out to be a good decision," he says, "I got an irreplaceable

education there."

During his early years in the business Danforth learned about the *non-technical* problems of professional filmmaking, of the petty rivalries and jealousies that seem to exist particularly in the effects field and of the unreasonable restrictions imposed on filmmakers by their own unions.

Perils of the Profession

It was while working on the George Pal production of *The Time Machine* as an

employee of Projects Unlimited that Jim Danforth made "The classic blunder of being right" and tasted the politics of filmmaking.

"I always assumed that everybody was trying to get the movie finished and that any idea that worked was a good idea. It took me a long time to realize that this was never the case. The object was for the boss to have the good ideas and for the employees to carry them out!

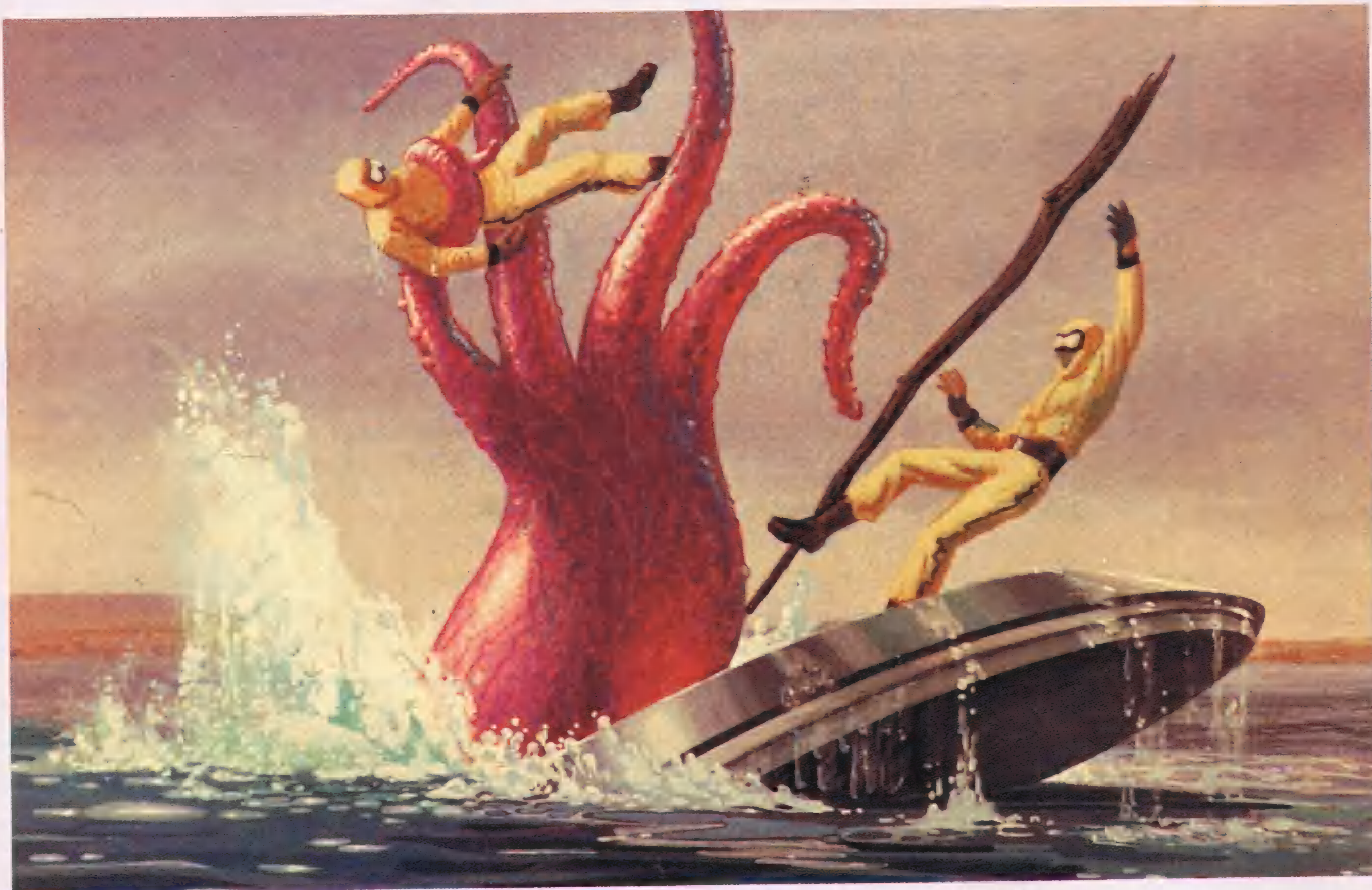
"They were trying to replace the sky in some footage that had been shot on the MGM lot. The shot contained full-size stone work of the lower portion of the pyramid into which the Time Machine had been dragged. We were going to complete the shot by matting in a miniature of the upper portion of the pyramid—the sphinx head—and a miniature painted sky. But there were trees in the shot that were to remain, only the sky around them was to be replaced.

"My job was to help paint the black matte for the trees. This was painted on a sheet of glass positioned in front of the miniature sphinx head and new sky. They had a Bell and Howell set up in front of the glass and were using that to roto-scope—to project through a film clip of the live-action scene. We were tracing all of the leaves of the trees. I remember saying, 'You know this *seems* to me to be not such a good idea. We might never get this. These trees might even be moving. We're trying to trace all around them and they're not always perfectly sharp.

"My idea was that since the scene pho-

Matte painting by Jim Danforth for *The Princess and the Goblin* (Blowup from 16mm).





Pre-production illustration for *Centauri III*—another unfilmed Jim Danforth idea. (Art created in 1973; story synopsis, 1970.)

tographed at MGM had a perfectly good sky, real trees and the full-sized base of the sphinx, it would be possible to add only the miniature sphinx head using a silhouette of the miniature to make its own matte. This would have avoided the difficulty of trying to replace the real sky with a painted background and blending

miniature trees into real trees—which is what Project Unlimited was trying to do. The answer was: 'Just keep painting Jim, just keep painting'."

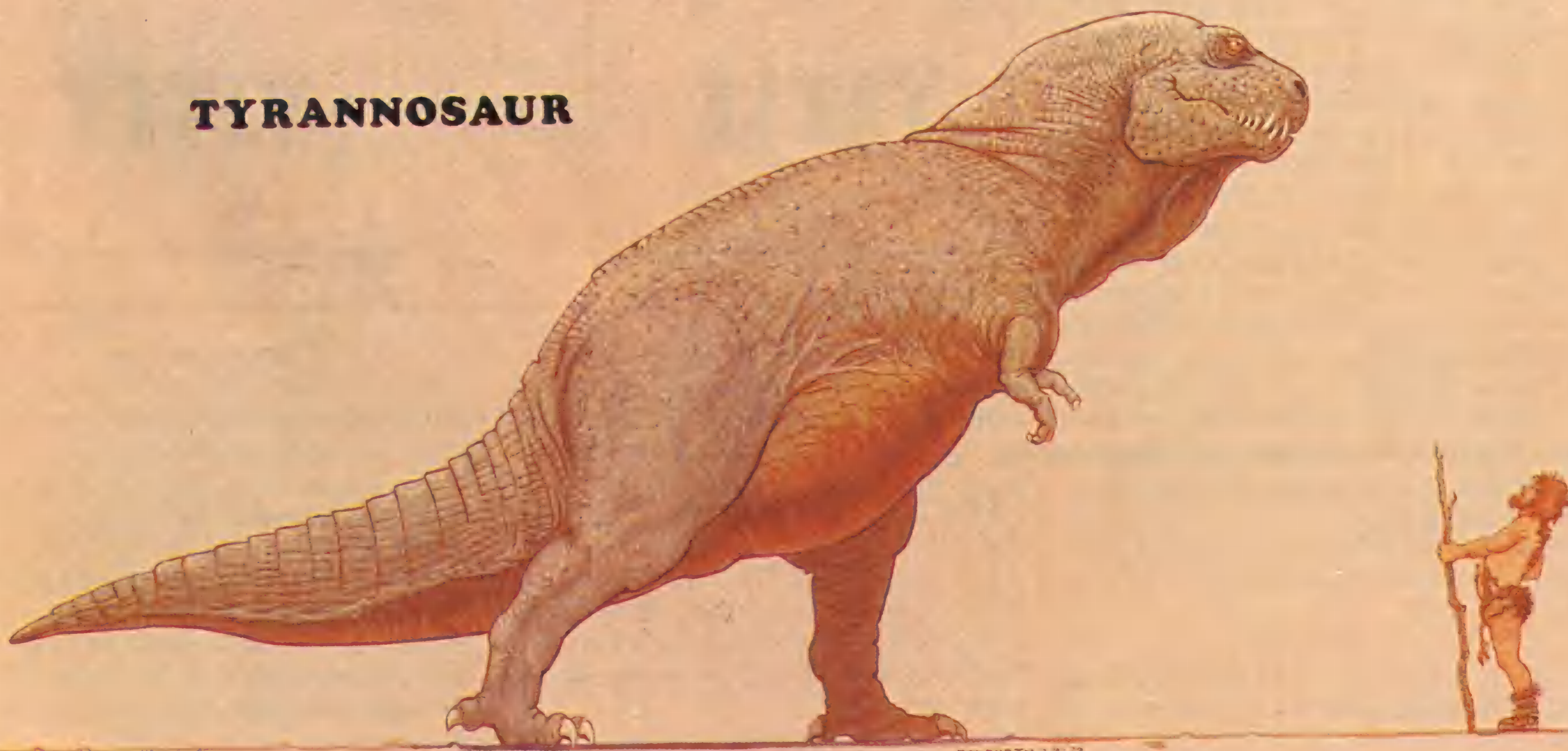
Danforth left Projects Unlimited shortly thereafter but one day stopped in for a visit to find that "They were doing the same damn shot over again and they

were doing it *exactly* the way I suggested! I think I had the presence of mind not to say 'I told you so.'

"Unless a guy speaks up, has ideas, and says what he thinks when he is 20, he's going to be no good when he is 30 or 40. If you turn yourself off then you'll just
(continued on page 54)

Jim Danforth's design for the comic tyrannosaur in *Caveman*.

TYRANNOSAUR



The Ripple Effect

This simple but very effective technique can add a special touch to your title sequences and can be used as a special effect with live action filming.

By JACK IMES, JR.

The ripple effect can turn your ordinary titles into liquid fragments for unusual transition shots, opening or closing credits, and for magical image distortion of live action subjects. The heart of the ripple device is a *liquid mirror*. This mirror works just like an ordinary mirror except that it can be instantly warped into dozens of tiny ripples on your cue, then quickly return to a normal flat surface. You can control the timing and amount of the ripple effect to produce a variety of optical effects in your film.

The Mirror

Step 1: Obtain a flat-bottom tray at least 8 by 10 inches. You can use a glass baking dish, photo tray, or even a cheap foil baking tray. The sides of the tray should be short, no more than 2 inches high. Figure 1 shows the basic type.

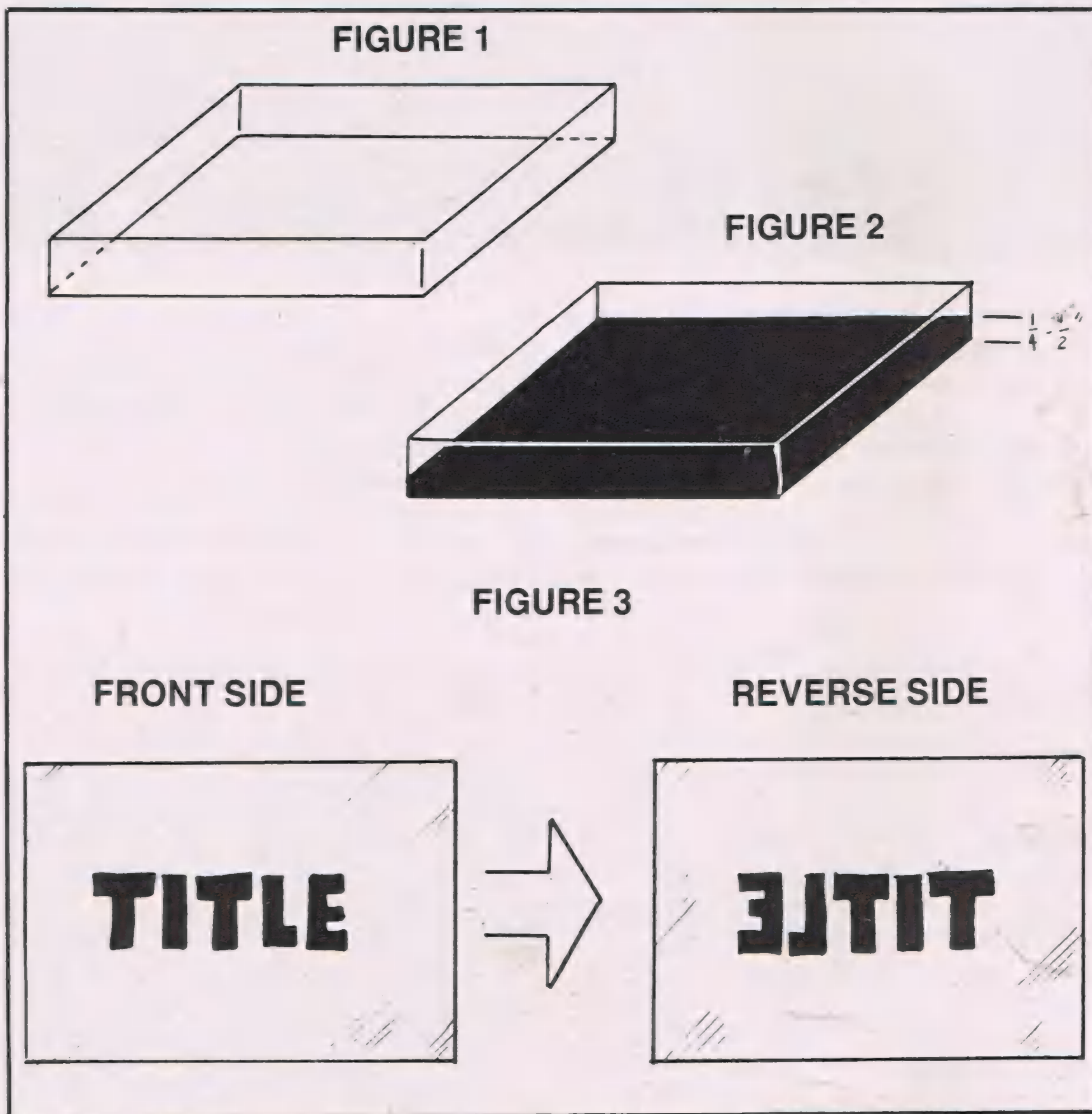
Step 2: Fill the tray with tap water to a depth of about $\frac{1}{4}$ to $\frac{1}{2}$ inch.

Step 3: Use black India ink or black poster paint (tempera) to color the water a solid black. Only a few drops of ink or paint are needed, but must be completely mixed to make a uniform black over the entire area of water. Add drops as needed until the water is totally black when left untouched by you. See Figure 2.

Step 4: Your liquid mirror is now finished. You will use the mirror to reflect anything you intend to photograph with your camera. A gentle shake of the tray will send dozens of ripple lines across the mirror to distort the reflection. The lines will rebound off the side walls of the tray to make more fragmented reflections. The liquid mirror is best used for tabletop title work, so you will have to prepare a set of titles in a special way.

Titles

Step 1: Use rub-down type lettering (also called *dry transfer letters*) to print out



your title or credits on a sheet of clear acetate about 8 by 10 inches. You can use a sheet of paper ruled with straight parallel lines under the acetate sheet to guide your letter placements.

Step 2: Mount the acetate sheet on a stiff piece of color construction paper with ordinary tape. Make sure the title is flipped over and reads in *reverse* as seen in Figure 3. You reverse the title because the mirror will reflect it as backwards to read correctly.

Photography

Step 1: Place the title upright 90 degrees to the ripple mirror on a sturdy table. The title card should be upside down as you see it. The reflection in the ripple mirror will be right side up and in proper reading order.

Figure 4 shows how the card and mirror should look. You can use a metal bookend or similar support to make the title card freestanding. The card should not be connected to the mirror in any

way.

Step 2: The camera should be approximately placed as shown in Figure 5 (side view). One or two lights can be placed to either side of the title card to provide even lighting across the card. Avoid getting the light glare in either the camera lens or the mirror reflection. When the camera is angled properly the title card reflection is framed correctly in the viewfinder. Note that the focus of the lens is on the image of the card seen in the mirror.

Step 3: The reflected image will be somewhat darker than a straight image, so your exposure will have to be adjusted accordingly. Automatic meters will do it for you, but manual apertures must be set to 1/2 to 1 stops wider. An exposure test is highly recommended.

Step 4: After shooting a couple of feet of still title, break up the image with a gentle shake of the water mirror tray. Ripples will distort the image. A stronger shake will totally break up the recognizable letters. At that precise moment, stop the camera. Change the title card (be sure to mount it upside down), shake the mirror tray to the same degree of break-up as before, then resume shooting. After about 1/2 second, stop shaking the tray. The water will immediately still and the new credit title will be easily readable. Repeat the process of shaking and change to produce ripple transitions between all your credits.

Other Tricks

You can also use the ripple mirror with backlighted titles. For these titles you take your clear acetate sheet with titles to

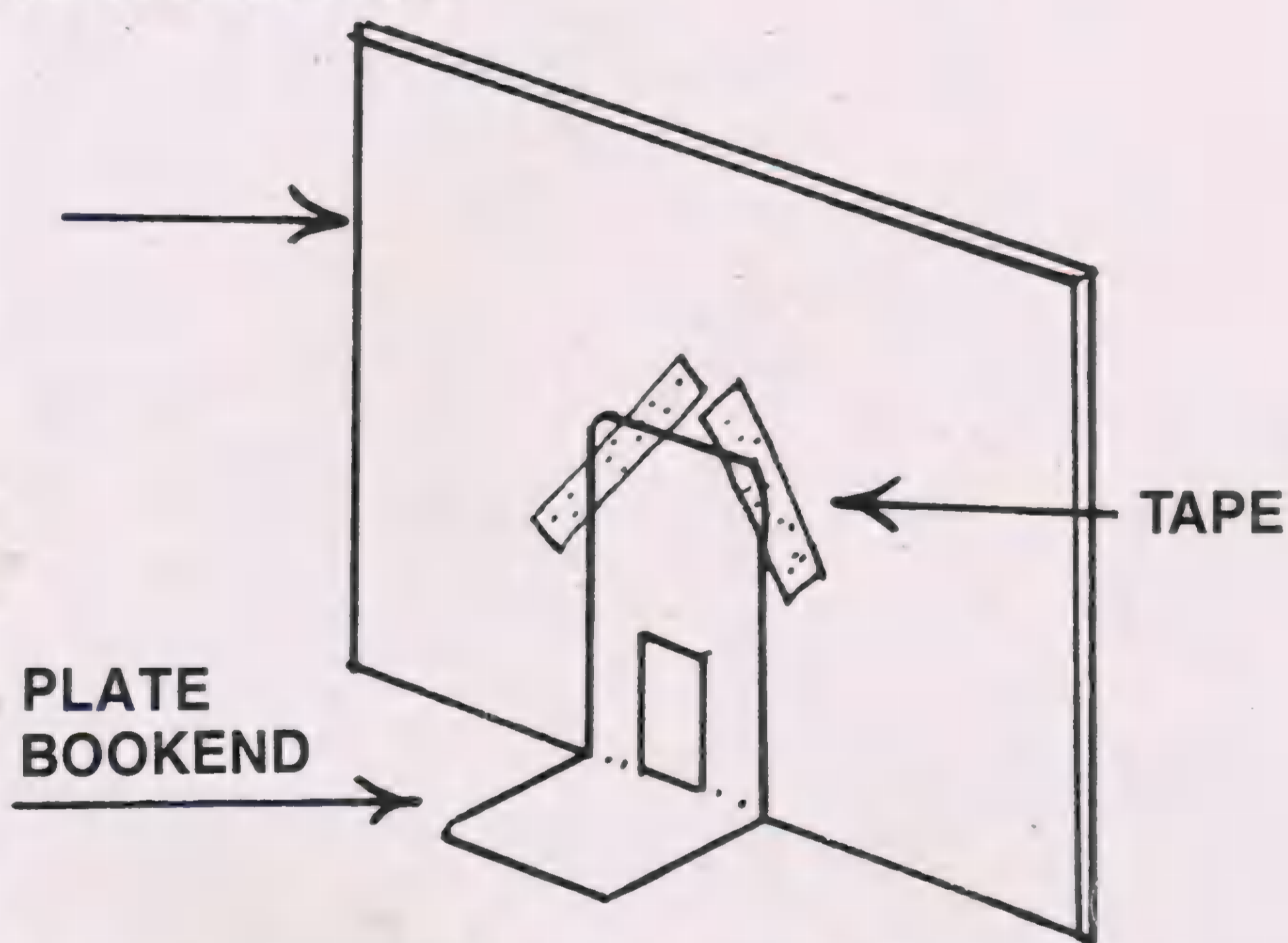
a local print shop and have the printer shoot a film negative (or contact print negative) on high-contrast graphic arts film. This will give you clear letters on a solid black sheet.

Mount the negative sheet onto tracing paper which has been either colored with inks or backed by a color acetate sheet. The credit sheet is then taped to a glass sheet (such as a picture frame) and backlighted for photography.

A video camera can also be used to shoot the ripple effects. If a television screen is placed in front of the ripple mirror instead of a credit title card, the video image can be ripple distorted as it is reshot by the camera. Instead of turning the TV upside down, simply invert the camera to keep the reflected image right way up. CM

FIGURE 4-A

CARD SUPPORT

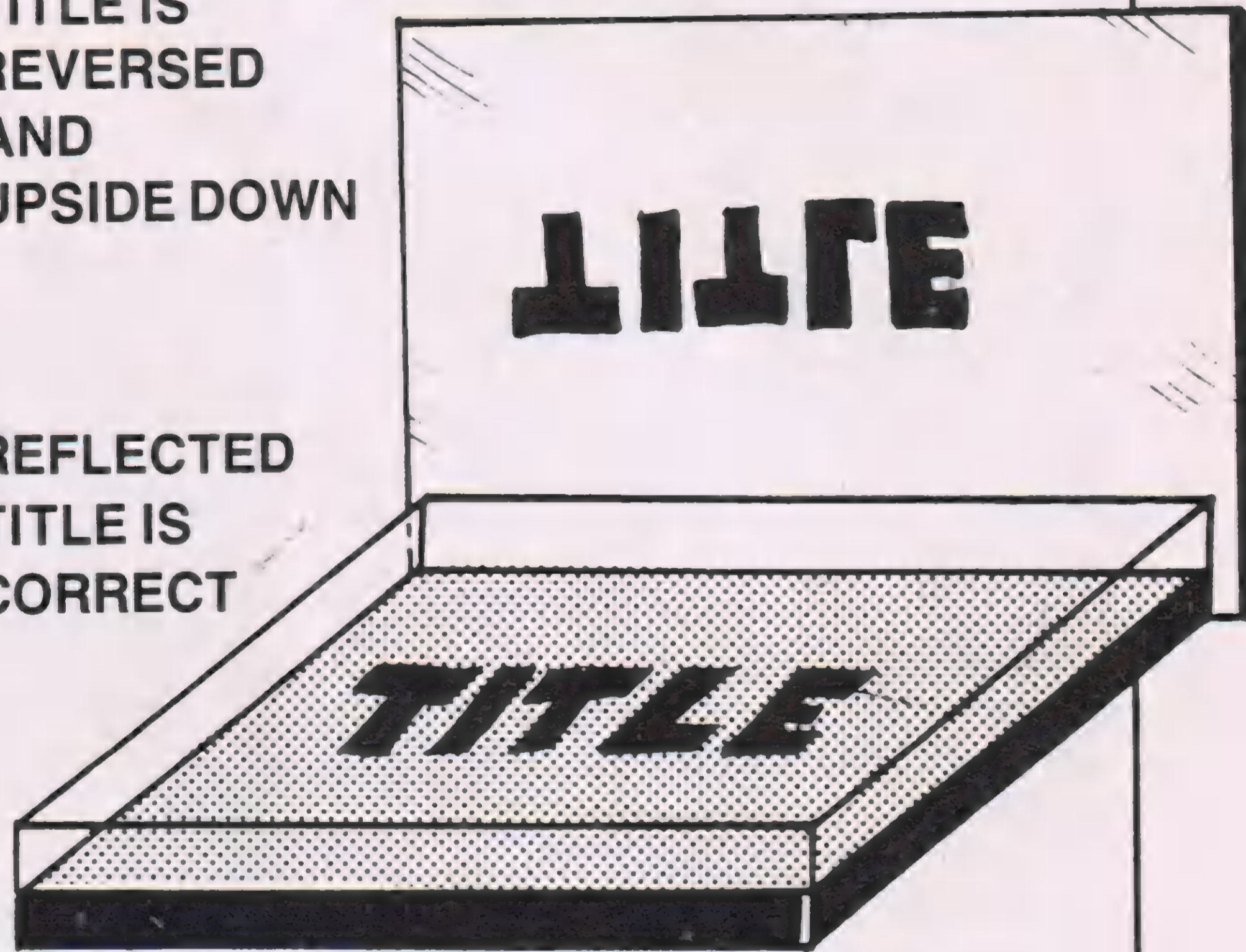


BACK VIEW OF TITLE SUPPORT

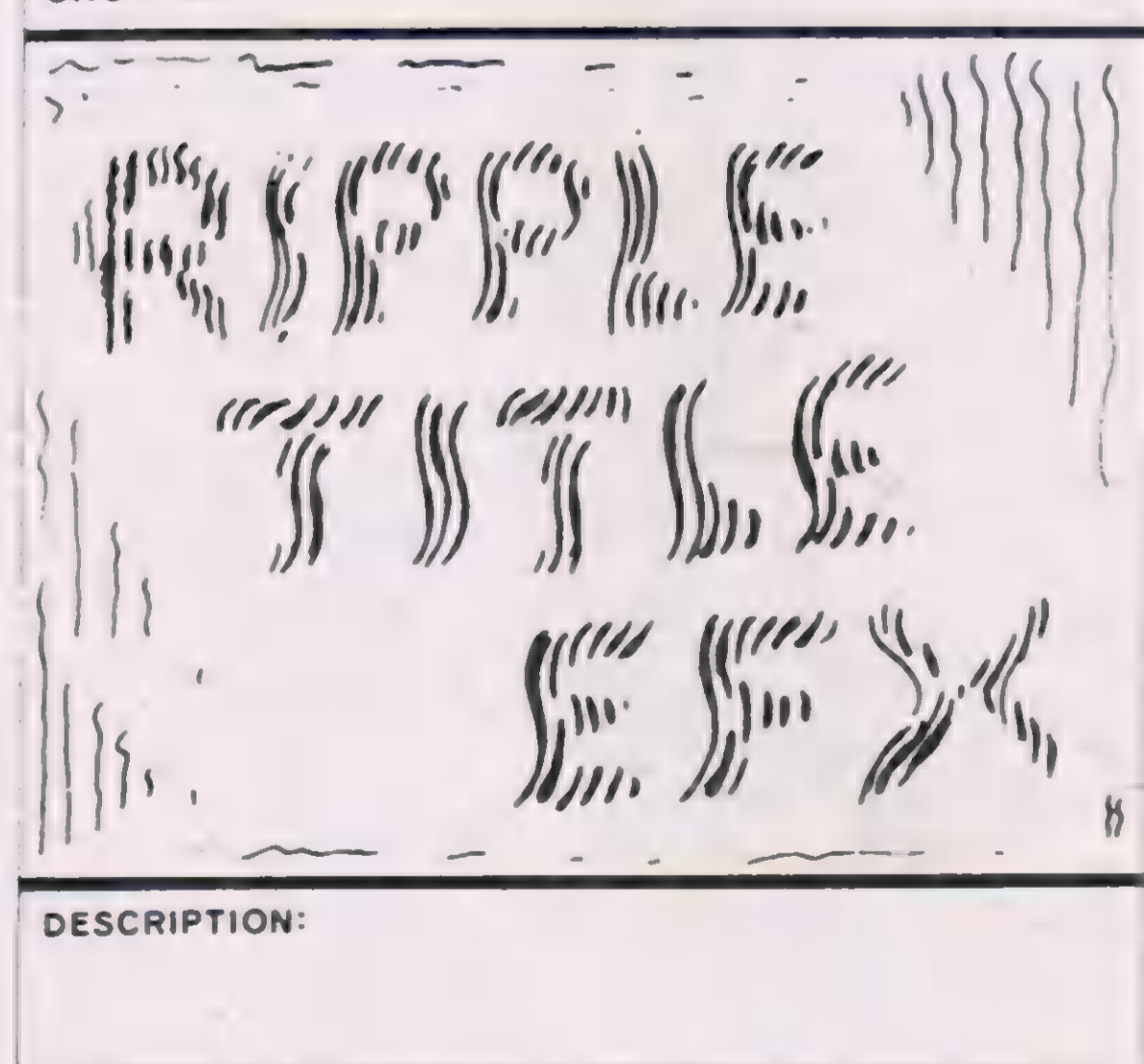
FIGURE 4-B

TITLE IS REVERSED AND UPSIDE DOWN

REFLECTED TITLE IS CORRECT



SHOT NO.

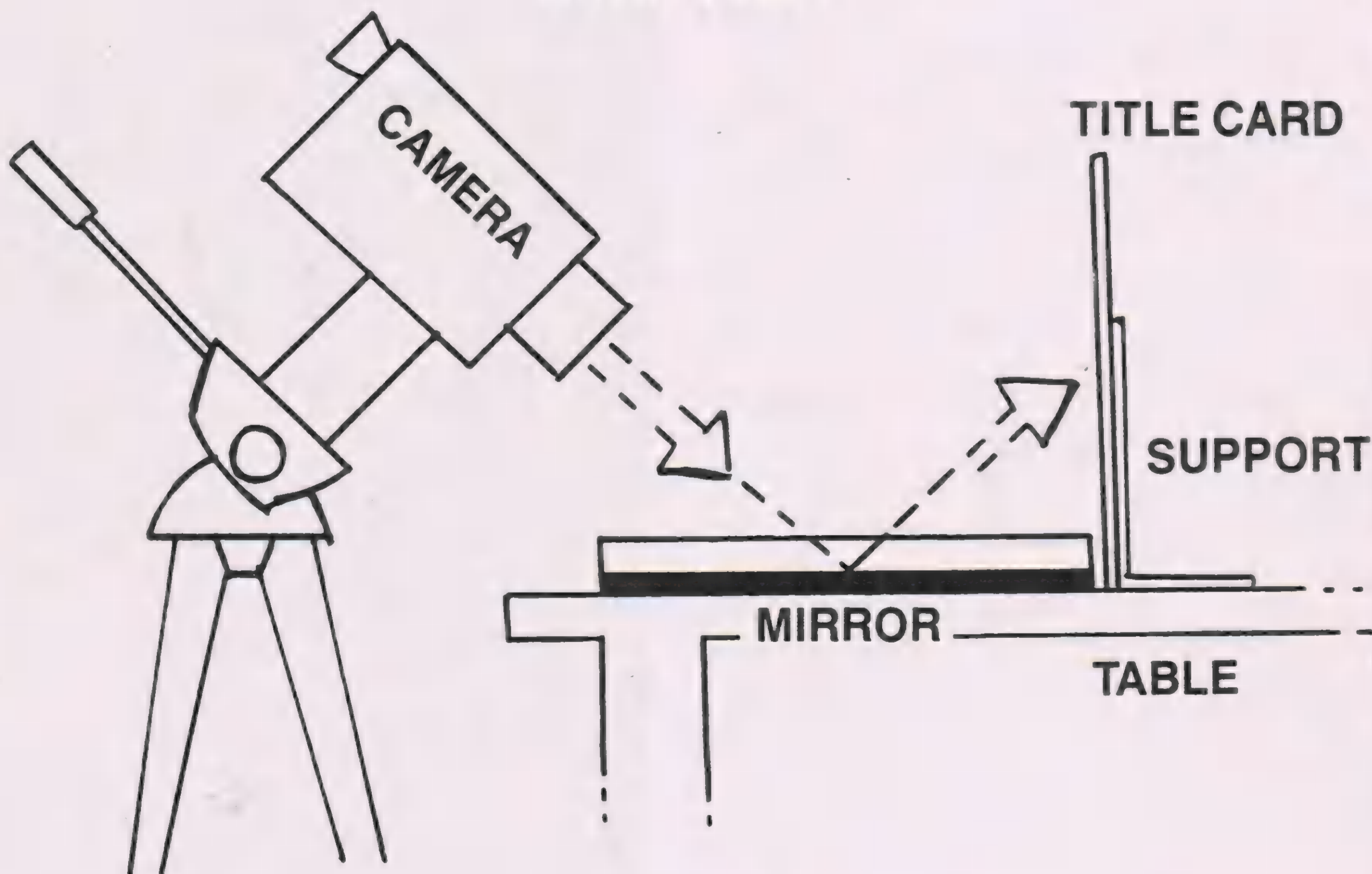


Materials

- Tray, at least 8 x 10 inches.
- Black India ink or black water paint.
- Transfer lettering sheets for titles.
- Still art paper, colored.
- Clear acetate plastic, 8 x 10 inches.
- Tape.
- Brush for dipping ink or paint.
- Optional: Bookend (plate type).

FIGURE 5

SIDE VIEW



ART. JACK IMES, JR.

Split-Screen “Dynamation” Technique

How the Pro's Do It—How You Can Do It

By PAUL MANDELL

When I was approached to do this article, a queasy feeling hit my gut. My mind reeled back to a rainy morning in May 1983. Ray Harryhausen and I were sitting in Lindy's, one of New York's landmark breakfast joints. Ray wanted waffles; they don't make them in England. At least, not the way they make them here. We small-talked about many things and eventually hit upon the Dynamation technique that he alone invented. Somehow, when you're drinking coffee with this living legend, you consciously circumvent the subject, to delineate yourself from the devotees who would sell their souls to corner him and pick his brains. Let's face it—if everyone knew precisely how Harryhausen, Houdini, and Blackstone performed their magic every step of the way, what mystique would they have had? Little would remain to nourish our sense of wonder, and that mystique alone has been essential to their popularity.

Still, I couldn't resist. What had always mystified me were some of his early black-and-white composites. Ray was about to taste his waffle when I flashed a still from *It Came From Beneath the Sea*. Graciously he pointed out where he had drawn his split-screen matte lines. A beat later, though, he sipped his coffee, peered upward through those remarkable heavy eyelids, and muttered: "I guess there aren't any more secrets."

The comment was really the punchline of a talk we were having about the techniques used in *Caveman*, but I still felt as though I had played devil's advocate. We laughed it off, but he was dead serious about it. When I voiced this memory to your editor, he tried to ease my conscience by affirming that there are enough budding Harryhausens out there who could benefit from this knowledge, especially those in advanced stages of experimentation.

Certainly any reader of *Cinefex* and CINEMAGIC knows how Dynamation effects are done. Puppet animation, rear projection, split screen, and glass art are all part of our collective consciousness.

Test clip from "The Stone Canyon Giant" sequence from Charles Band's forthcoming *Rage Wars*, final composite and matte.

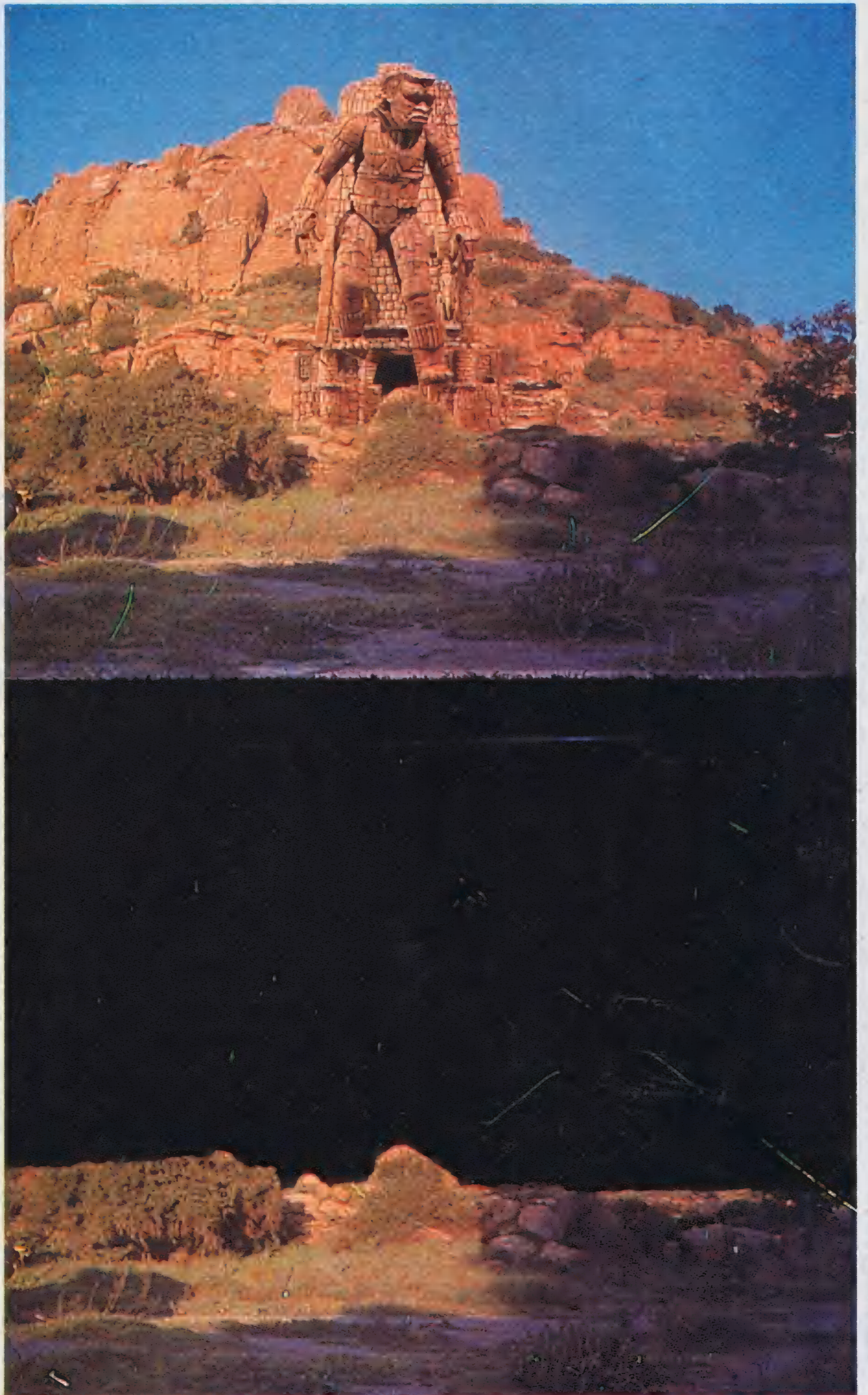


PHOTO: COURTESY PAUL MANDELL

What really hasn't been explored are the specifics of how the pro's *create* those split-screen mattes, how the process image is sectioned off, and how this relatively archaic (but still very magical) technique can translate to 16mm. So forgive me, Uncle Ray. Here I am, revealing some more "secrets of Dynamation."

In a standard Dynamation setup, a rear projector throws a low contrast image on the back side of a grommeted process screen. (The Stewart screen has been a mainstay for years. However, contemporaries like David Allen and Jim Danforth prefer newer materials manufactured by the Polacoat and Uniscreen companies, which yield a more even, better resolved image.) Some situations call for the masking of undesirable parts of the process footage, or the addition of rocks and trees. A large pane of glass is often positioned directly in front of the screen, allowing painted elements to be introduced.

The animation puppet is bolted to a predrilled platform several feet in front of this. The platform is generally clamped onto a large wooden sawhorse, raising it for alignment with the process image. Finally, a high quality "split-screen" matte glass is mounted several feet between the puppet stage and the animation camera. Then comes the tedious process of creating the opaque matte on the glass to blot out the puppet stage, to create an inconspicuous matte line for the creature to "stand" on, and to mask certain areas of the background image that you would want to appear to be in *front* of the creature.

The methodology employed here seems primitive and almost masochistic. But strangely enough, the matte-counter-matte system developed by Ray Harryhausen for *The Beast From 20,000 Fathoms* is still viewed by stop-motion luminaries as the most practical, and is the only system used for their Dynamation splits.

The matte is created by trial and error. It is that simple, and that tedious. The first step is to apply temporary strips of black tape to the process screen once the projected image is scrutinized. This gives the animator a specific reference that can more easily be judged through the viewfinder. It then becomes a matter of looking through the camera, walking up to the glass, applying strips of black tape to the glass, returning to the camera, and readjusting the tape strips to conform to the desired matte line dictated by the projection. Producing an opaque matte can take three to four hours or longer and is generally the animator's biggest headache. Of course, if the creature is to stand on a line (a sidewalk, for example) the tedium is minimized. But when the split requires the masking of specific shapes (boulders, trees, or parked cars), you can wear the rubber down on your

Nikes. And the lining of your stomach!

It may seem convenient to have an assistant tape the glass as you remain fixed to the viewfinder, but that can present a problem in itself. Dave Allen, a master of split-screen matte work, sees it that way. For the new film *Rage Wars*, Allen created an intricate sequence called "The Stone Canyon Giant" and directed the live action. The Dynamation effects were done solo.

"The problem is," says Allen, "you'll get a guy working with you on the matte glasses and it does save a bit of time. But eventually you are saying 'Come a little more over to the left' and it gets exasperating. Finally you have a tendency to grasp the razor out of his hands and cut the taped matte line yourself! Assistants are good for blacking in broad areas. But it can get hairy.

"The system is archaic by today's standards, but it works. And the splits are something that you hate to tear apart when they're done. So much decision-making has gone into them."

Why, you may wonder, is this opaquing process not done as a rotoscope situation on an Oxberry? By projecting a frame of the background down on the flatbed, inking cels and producing silhouette matte rolls that can be bipacked with the raw film in the animation camera, all this trial and error could be eliminated. Sounds logical, doesn't it? Yet there are reasons for avoiding that route.

Optical splits tend to be the sharpest things in the picture when you're using printed mattes and counter-mattes run in bipack. One nice thing about the Dynamation process is that the splits on glass have a desirable softness to the edges, which has to do with the fact that the taking camera is focused back on the process screen. The splits are photographed with depth-of-field consideration and the tension is taken off the matte line. Opaqued cels can be photographed slightly out of focus on an Oxberry stand and bipacked during animation to achieve the same soft edge effect, but the result would be far less predictable than good old Dynamation glass work.

Once the matte is produced, just *how* do the pro's create a counter-matte? An obvious solution would be to spray-paint the matte glass and simply peel away the tape, reversing the situation perfectly. But there are two flies in the ointment. You've destroyed the original matte, thereby precluding any possibility of a retake. Also, there is a certain *displacement* area that has not been compensated for. A very fine gap must remain between the matte and counter-matte, if the process images are to merge properly. Without this displacement consideration, the matte lines would overlap undesirably in the composite. Theoretically, the spray-painted edge could be scraped

away ever so slightly, but that brings you back to the labor-intensive operation again.

What Jim Danforth used to create his splits on *When Dinosaurs Ruled the Earth* was a wooden frame with a *double slot*, a system he presumably got from Ray Harryhausen. The frame allows two matte glasses to slide in, and one can be checked against the other for the displacement area. The double slot system is critical in producing successful Dynamation composites in professional formats.

"The system was Jim's idea," Dave Allen explains. "Ray has probably used it for the last 25 years, but I'm not sure. Using this system, all you have to do is slide the matte and the still-clear counter-matte into their slots. Then you work upward from the matte line by eye with tape or paint to create your counter-matte. But you have to be observant. Once you have two glasses, there's a slight parallax displacement. You have to look very carefully while standing in *front* of the camera, to take advantage of the distance between the two glasses. An exact counter-matte will begin to go off axis to the left and right.

"The 1/16 of an inch gap you must leave between them can be a devilish experience! I occasionally miss. Generally I will have too much of a gap. I've actually done some Dynamation splits that were so tight, the split between the glasses was alternately white and gray. Yet by eye it looked the same all along the line."

Allen uses an adjunct system for creating very complicated mattes. First the matte is produced on one glass after many hours of trial and effort. He then lays the glass face down on a three-by-four-foot neon light box, which is actually used for examining frame clips. The clean glass used for the counter-matte is placed directly on top of it. Scanning the matte line by eye, he uses black cartooning paint to draw the counter-matte line as fine as possible.

"You have to look *straight down* onto the split. You have to stand above it, sometimes on a chair, and pan your head along the line to make sure that there's no trick on the perspective. Even the thickness of the glass can be a factor. *Caveman* had an incredibly complicated shot in which the tyrannosaurus came from behind a tree into a clearing. There's the lizard *behind* the tree with the falling caveman, with all kinds of spidery details on the scene. That was one instance where I had to draw the counter-matte with a fine brush, by eye, on a light board. It took hours. After that, it was comforting to see the split working with the right amount of gap through the double-slotted frame."

With all this trial and error work, there must be a simpler way. Actually there is,

(continued on page 50)

Skull-Bashing Made Easy

Building ball-and-socket skulls for animation armatures.

By KENNETH WALKER

A puppet animator bases the success of his art and craft on being able to precisely position his animation model for each frame of film. To get the best and most secure results, he must use a metal skeleton or armature inside his creature. The skull can be one of the most intricate parts of the armature.

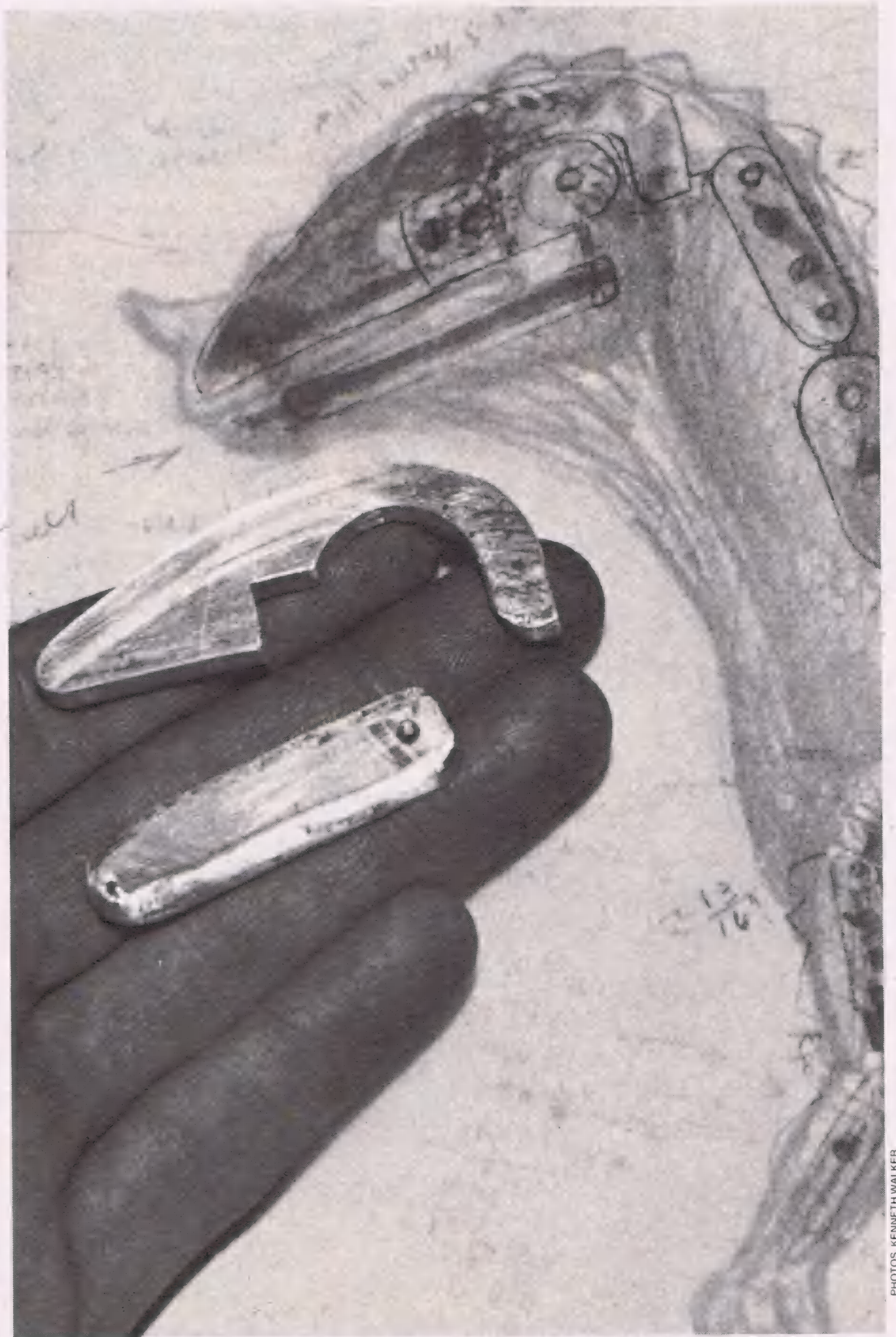
In order to mimic the way a real jaw works, the skull usually has to include its own ball-and-socket joint, for realistic chewing and other mouth movements. Such a jaw complicates the construction of the skull itself, but it's a necessity for side-to-side as well as up and down motions.

Sculptor Ken Brilliant designed this particular armature to go inside one of the dinosaur puppets for John Dod's newest film, *Dinosaur Rag* (see *CINEMAGIC* #23, pp. 22-23 for photos of the entire armature). Ken specified movable jaw for the skull, so I set about machining one to his requirements as laid out in his scale mechanical drawing.

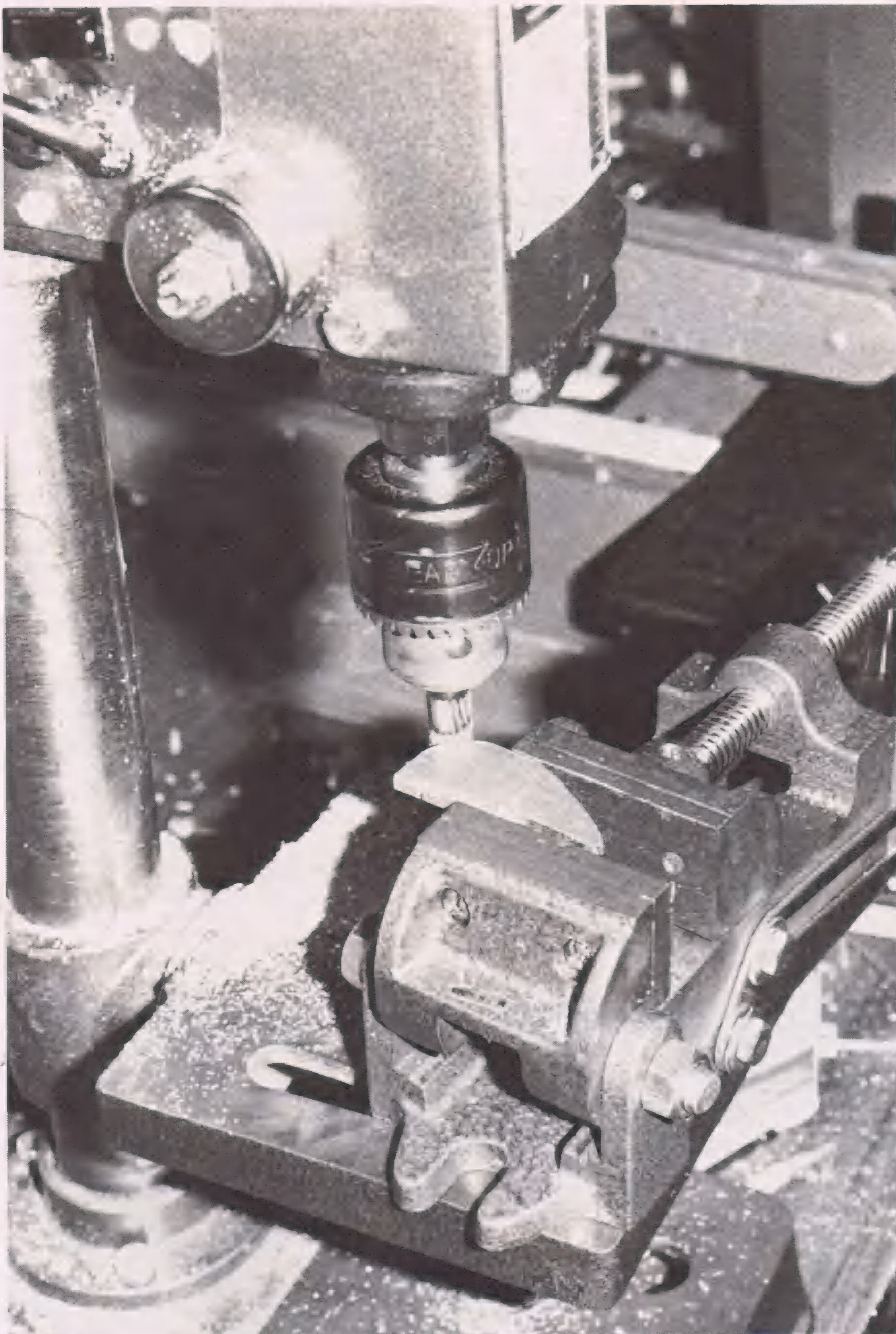
The methods described here do not make use of welding or brazing of metal to metal (really the best way to go) as those heat-involving techniques can be both difficult and dangerous for the uninitiated. Instead, construction methods are presented that rely on easily-learned mechanical skills, skills that I'm sure you will put to use on other projects.

Metalworking is an art and science unto itself. It seems that everytime you do a particular operation one way, you find another, better way to do it. Because I was relatively new to machining metal on such a small scale, I learned a great deal from this project: the do's and don'ts of working with various metals; what tools are best for the job at hand; even how to consistently drill and tap a good clean hole in a metal ball.

Although the techniques and materials laid out here do not necessarily represent how I would do things now, they served very well for this project, and you'll get good results from them. But don't assume this is the only way to make armature parts; experiment on your own. You'll be amazed at how much you can learn.



The upper and low skull pieces are milled out of solid aluminum. Note the internal rounded space in the top piece. This is where the ball joint will go. In the background can be seen Ken Brilliant's mechanical drawing of the armature showing its position in relation to the finished dinosaur.



The aluminum block for the upper skull piece is held firmly in a machine vice. A rotary file bit in the drill press grinds the skull to a more rounded shape.

Materials

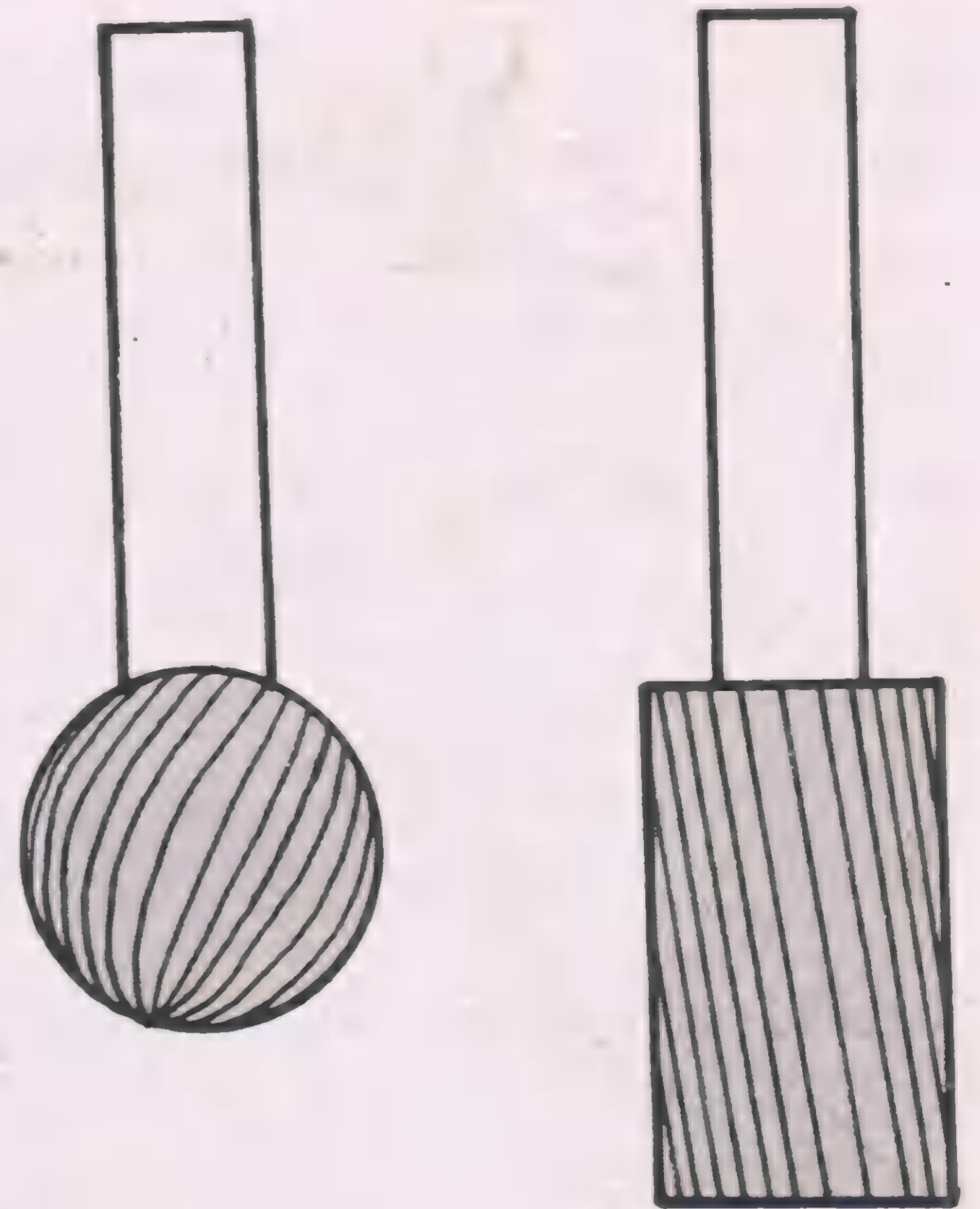
Without exception, all materials used in the skull (including the various nuts, bolts and washers—even some of the tools) are available from Small Parts Inc., 6901 N.E. Third Avenue, P.O. Box 381736, Miami, Florida, 33138. Materials to be used for the ball joint itself had already been decided on—an aluminum ball surrounded by steel plates—so these were the materials I worked with for the major portion of the skull, namely the upper head piece and the lower jaw, I decided to use ¼-inch thick by one-inch wide aluminum, simply because it machines easily and is lightweight. This was an important consideration because the head of the beast had to stretch out in mid air, so to speak.

Milling

The making of this dinosaur skull entailed a great deal of shaping of the various pieces of metal involved, particularly the thick aluminum. Rounded edges on these pieces were a must, in order for the skull to fit within the proposed head shape of the dinosaur.

Using both a hacksaw and a motorized hobby scroll saw, I cut out the major metal shapes to their approximate dimensions. Then, using various milling tools, I shaped and rounded all the edges.

Milling is the grinding away of material using various rotary tools and bits. For this work I used two very important tools, a drill press and the Sears version of the popular "Moto tool," a hobbyist's hand-held power tool that spins at something



ROTARY FILES

Left: Round rotary file for milling ball sockets. The ball shape of the bit is the same diameter as the ball you will be using. **Right:** Cylindrical rotary file for general removal of metal. This is a "side-crushing" bit.

like 25,000 rpm. I consider these to be normal home shop tools.

"Normal home tools" is a relative term, of course, and could mean just about any tool depending on how seriously you are interested in making mechanical things. If you *are* serious about it, I must stress the importance of investing in at least a simple drill press. I'm not talking about one of those accessories that converts an ordinary electric drill into a drill press, although you can certainly do some good work with one of those. I am speaking of the stand-alone type of machine that is built quite massively and that can take up to ½" diameter bits. These are available at Sears and at most home center stores for around \$90.

"To machine the skull (and the rest of the armature) I used the drill press constantly, both for its intended purpose *and* as a milling machine. An accessorized electric drill would not have been able to handle this type of work; a bonafide drill press's great mass plays an important role in milling operations.

There are special milling bits available for these tools called *rotary files*, which are made for removing metal. They don't *look* like files, of course, as they are essentially drill bits with a lot of sharp spirals cut into them. They do a fantastic job of "eating into" metal. These bits are not usually available from the corner hardware store; you'll have to go to an industrial supply house for the drill press version, and to a hobby shop for the Moto tool version.

The upper part of the skull needed a rounded space milled out of it, so that the "jaw ball" would later fit into the space without touching. I did this major milling with the drill press, by holding the aluminum in a heavy machine vice (*not* in

my hand!) As the Moto tool is better for the fine removal of material, I used it to grind the lower jaw into a long, somewhat rounded shape, necessary so that it would fit into the restricted space of the lower part of the dinosaur's head. (Holes would later be drilled through both pieces of the skull, to further lighten them and to give the foam rubber something to grab onto.)

It should be mentioned that this same type of material removal can be done with hand files—particularly with what are called “jeweler’s files”—but this takes a lot of time and patience, as there is usually a lot of metal to be ground away.

I must admit that rounding the edges of the metal pieces has a purely esthetic value to me: it simply enhances the beauty of the skull (if you are inclined like I am to see beauty in a hunk of metal).

In its overall configuration the skull armature is similar to a human or animal skull, in that the jaw pivot is located behind and above the teeth, and the lower jaw is the only part that does any moving. The ball-and-socket joint of the armature needs to be positioned at this pivot point in order to move realistically.

Press Fits

Obviously, some means has to be devised to mount the 1/2-inch ball itself to

the lower jaw piece. One way to do this is to drill a hole about 3/4ths of the way into the ball; then, a slightly larger diameter nail is pounded into the ball, forming what is called an “interference fit” or “press fit,” between ball and nail. In a similar way the lower jaw is pounded onto the nail (with its head now cut off.) This can be a very strong joining method under most circumstances, and any slight fattening of one side of the ball due to hammering does not affect its performance. (To keep the ball nice and round, you can mill a simple socket into a flat piece of metal to “hold” the ball while you pound the nail into it.)

Drilling and Tapping

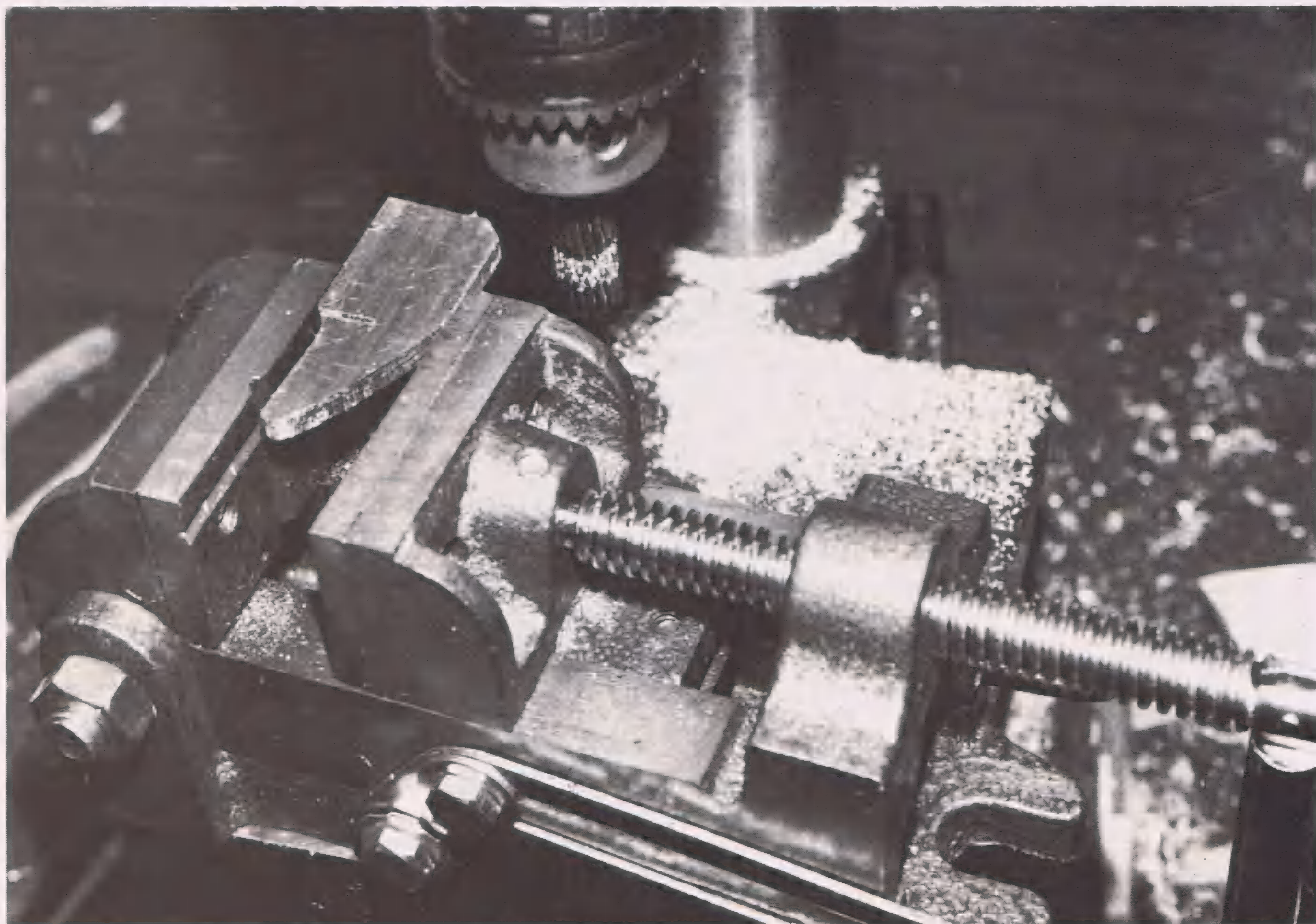
I prefer another method, though. The one I used is to drill *and tap* the ball—that is, create a threaded hole—into which can go a small-diameter bolt (machine screw), say one with a 4-40 thread designation. Before joining bolt to ball, a glue or other hardening fluid is needed, to keep the bolt from unscrewing out of the ball. After trying both superglue and epoxy (neither of which proved strong enough) I found a liquid “thread-locking adhesive” called Allen Loctite. With a toothpick, I spread the very viscous Loctite around on the inside threads of the ball, making sure it went deep into the hole, then applied it lightly to the end of

the threaded bolt. The bolt was then simply screwed tightly into the ball, and the excess Loctite wiped away.

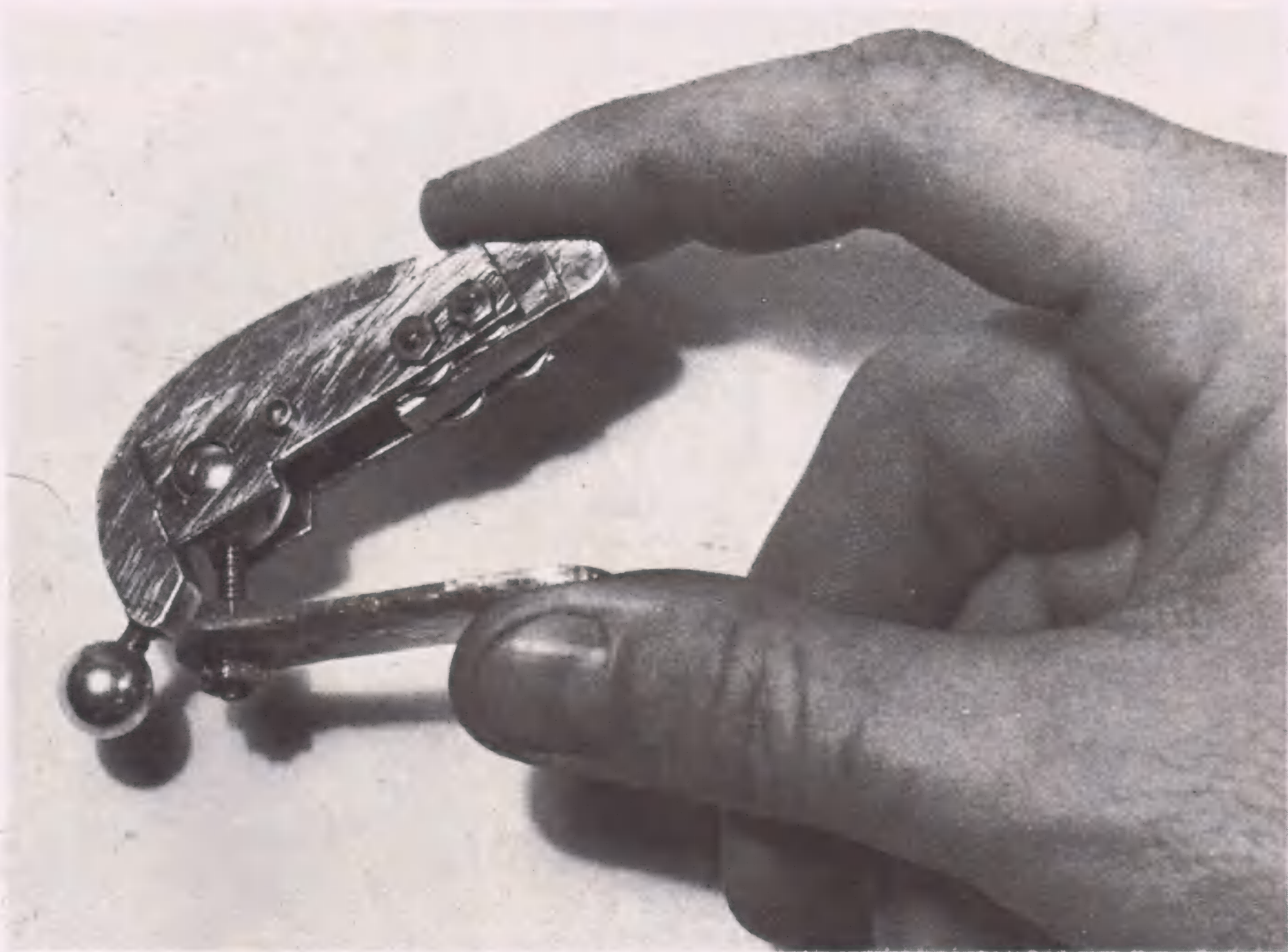
Allen Loctite is quite an amazing product, especially the high-strength version that I found. As an experiment, I drilled and tapped a ball, screwed a bolt into the hole along with a single drop of Loctite, and then baked the whole thing in an oven at approximately 275 degrees for 6 hours (to really test what it would encounter in the foam casting process.) If anything, the Loctite became *stronger* (although I didn't prove that conclusively) and the bolt was actually impossible to remove from the ball. In fact, using a pair of pliers, I *really* tried to separate the ball from the bolt. The ball itself never moved, but the bolt broke in half! Such strength approaches that of welding or brazing, and Loctite is much easier to apply and use.

Once the bolt and ball of the armature are joined together, the lower jaw needs to be affixed to the *other* end of the bolt. This requires cutting off the head of the bolt. You can use a hacksaw for this, or an Exacto saw blade. I used the Moto tool with a thin abrasive “cut-off wheel” mounted in it. The tool's high speed of 25,000 rpm makes quick work of slicing through bolts, etc. and the cut is very smooth. You may have to file the threads slightly if you use a hacksaw. The lower

The rotary file bit in the drill press can be seen in this close-up photo showing the many sharp spirals cut into it. Its job is to mill or grind away metal. The upper skull piece is shown in the early stages of milling.



PHOTOS: KENNETH WALKER



The completed skull ready to be inserted into the rest of the armature. Note the ball at the back of the neck.

jaw is then drilled and tapped, and joined to the free end of the bolt using a nut on each side of the lower jaw piece and some type of joining adhesive.

This method of securing the lower jaw piece allows you to easily vary the distance between it and the ball, by screwing the bolt through the jaw piece until it is at the right distance, before tightening the nuts down.

I should mention a special jig I came up with to hold the aluminum ball while drilling and tapping it. To keep from scratching the ball, I used a wooden, socketed, two-piece ball holder which tightens around the ball very firmly via bolts and wingnuts. I could then grasp the holder comfortably or secure it in a vice. Since the sockets are not very deep, there is still room between the two pieces of wood to insert the drill bit or tap.

Joint Perspective

A typical ball joint is made of two plates which form a two-sided socket, sandwiching the ball tightly but still allowing it to move when pressure is applied—hence it's called a sandwich ball joint.

There are basically two types of sandwich ball joints: those holding only one ball; and those with a ball at each end. Without a doubt the first type is easier to

make, since the ball sockets in the two plates need not be super-accurately aligned *while* drilling and milling, only afterward, when the joint is put together (and at that point the ball itself helps align everything). Conversely, the two plates of the double-ball type of joint *must* be machined with great precision, or the two balls will not have the same amount of tension, one will exhibit "ball drift" as it moves, etc. Luckily for us, the skull's ball joint is of the single-ball variety.

The sandwich plates are made of $\frac{1}{16}$ -inch thick steel, which I found to be adequately strong. Although the drilling of the sandwich plates is not a tremendously precise affair, you would do well to clamp both pieces together before drilling, to help assure the later alignment of the socket plates around the ball. Drill *four* very small holes—using no larger than a $\frac{1}{16}$ -inch drill bit—through both pieces simultaneously; note which sides of the plates are to be the *insides*. Later, you'll enlarge all of these holes.

Since the skull is by nature a miniature construction, it was deemed appropriate to use miniature machine screws to hold the sandwich plates together. The pressure of the plates against the ball is accomplished by the tightening of a single machine screw. I used a 2-56

threaded *socket head cap screw* for this. Socket heads are meant to be tightened with an Allen key, also called a hex wrench, which is a hexagonally-shaped screwdriver available from any hardware store. This gives a much more positive fit between tool and bolt head than an ordinary slotted screwdriver and screw, and the L-shape of the tool handle lets you apply a bit more force. In addition, a hex-sided hole is easier to locate under foam if you have to go back into your model at a later date to tighten one of the joints.

The holes for the jaw-tightening bolt are located as close to the ball joint itself as possible, without interfering with the ball's movement. One plate's hole is redrilled to allow free passage of the 2-56 machine screw, but just barely so. The other plate is redrilled with a #50 drill bit, then tapped with a 2-56 thread.

The 2-56 designation specifies the diameter of the machine screw (a #2, very small) and the number of threads per inch. Since the holding strength of threads decreases as their size decreases, I felt this was about the smallest machine screw I could use without stripping the threaded steel plate upon tightening.

Socket Making

The making of ball sockets is as much an art as a science, it seems. Neverthe-

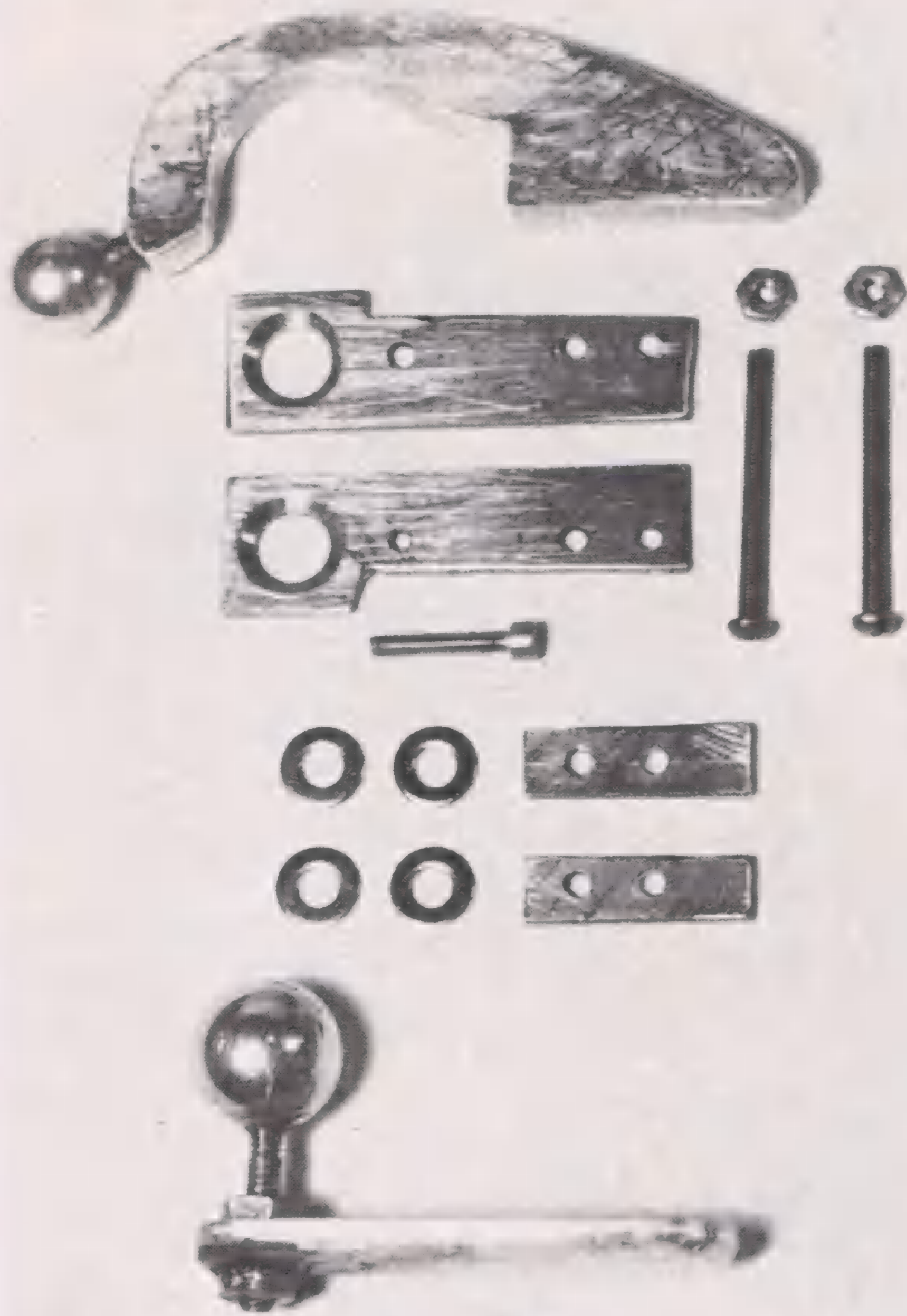


PHOTO: KENNETH WALKER

The complete "skull kit" shows the scale of the parts, before final assembly. The long machine screws will be cut shorter in a later step.

less, I experimented and came up with a somewhat systematic approach:

The designated hole in each plate is first enlarged using a $\frac{3}{8}$ -inch diameter countersink bit—thus creating a conical hole. You want the top of this conical hole to be about $\frac{3}{16}$ -inch across, no more. Then go back and enlarge the hole itself with a $\frac{1}{8}$ -inch drill bit. After all of this, you use the $\frac{1}{2}$ -inch diameter *round rotary file* bit in the drill press to change this conical hole into a rounded, cup-shaped socket that will fit the ball. Don't make this too wide; it isn't necessary to dig this bit deeply into the socket plate. There are reasons for this.

It's a fact that the less contact between two moving parts, the less friction that will be developed. Although a ball-and-socket joint *depends* on friction to work, the above principle can be used to advantage in a home-made socket. For my own skull I milled the sockets only so deep that the ball would not pull out when sandwiched between the two socket plates. This reduced the overall contact area between ball and socket, and minimized any irregularities due to the milling operation itself—and they can be many!

The sockets in some professional ball-and-sockets armatures seem to have the balls deeply recessed into the socket

plates. For this to be done successfully, the use of a ball-end milling tool is required. A ball-end mill, which is essentially a large-diameter drill bit with a perfectly hemispherical cutting end (like a half sphere), is meant to be used in a professional *mill*, whose great mass can withstand the extreme forces and vibration that occur when shaping metal with such a bit. It gives a completely professional finish, though, with no irregularities. A round rotary file, however, can be used in an ordinary drill press—even a lightweight one—and can do many of the things that its more professional cousin can, without destroying the drill press in the process. Unfortunately, by using a home drill press/round rotary file combination to make sockets, you are always at the mercy of *chatter* (a type of vibration of the tool bit itself), due to the drill press just not having strong enough ball bearings to keep the bit perfectly steady. The result can be a *very* rough socket, with visible ridges on the walls. You can reduce or eliminate this simply by not milling the socket that deeply into the steel plate and by using liberal amounts of cutting fluid, like Tap Free .

If you want to further reduce the contact area between ball and socket, without sacrificing the strength of the joint go back and redrill the finished socket *hole*

to be a little bit wider than it is, leaving some of the socket itself of course. The result of all these operations can be very smooth but nice and tight ball movement.

In the photos, note the two small rectangular metal pieces with the two holes; these are simple spacers, to help keep the socket plates parallel when the joint is tightened around the ball. The thickness of these spacers depends on how deeply you have milled the ball's sockets. I found that $\frac{1}{16}$ -inch steel worked fine for this. Note that the socket plates and spacers are joined to the upper part of the skull with two 2-56 machine screws. None of the holes were tapped, although you can, if you prefer, do to to one of the socket plates; this will eliminate the need for the two nuts that I used to hold the whole thing together.

All that remained for the finishing of my skull was the mounting of another ball to its rear, to connect it to the rest of the dinosaur's armature. Use the same drilling/tapping/Loctite technique described earlier or—if you prefer—you can use the easier "press fit" method.

A few comments are in order concerning the choice of materials for this armature. The general scheme was to use

(continued on page 61)

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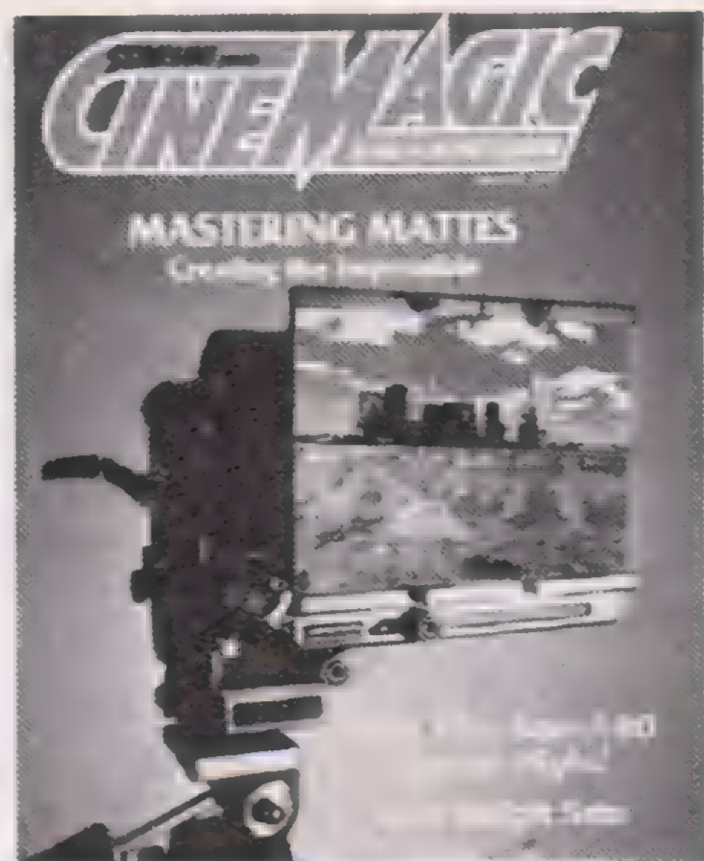
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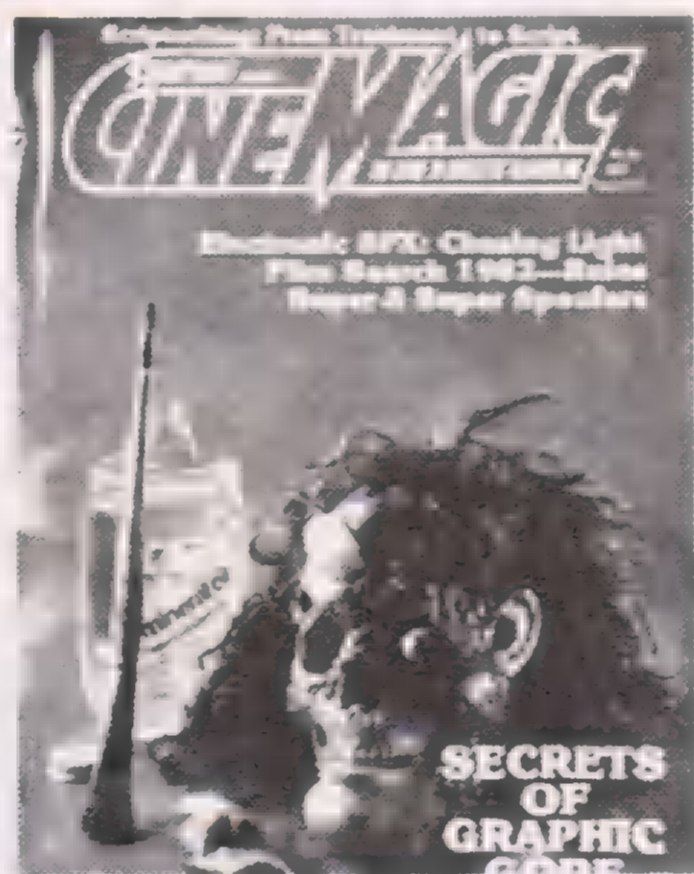


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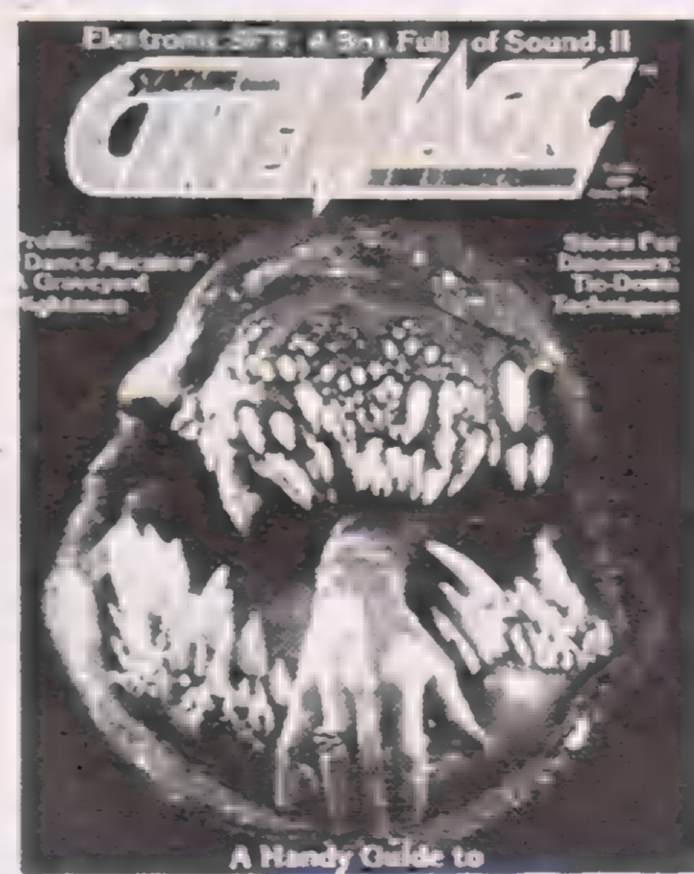
#16—Script Writing, Part 2; Electronic SPFX—LED Circuits; Flat Art Explosions; Careers—Frank Van der Veer; Build Your Own Camera Crane; Profile—Steve Parady and Bill Rudow.



#17—Script Writing, Part 3; Production Managing Low Budget; Electronic SPFX—Light "Chaser"; CINEMAGIC/SVA Contest Rules; Secrets of Graphic Gore; Profile—Chris Callaghan and Bob Griffith.



#18—Making Monsters; Tie-Downs for Animation Models; Accessories for Filmmakers; Electronic SPFX—Redesigned Sound Generator; Profile—Al Magliochetti.



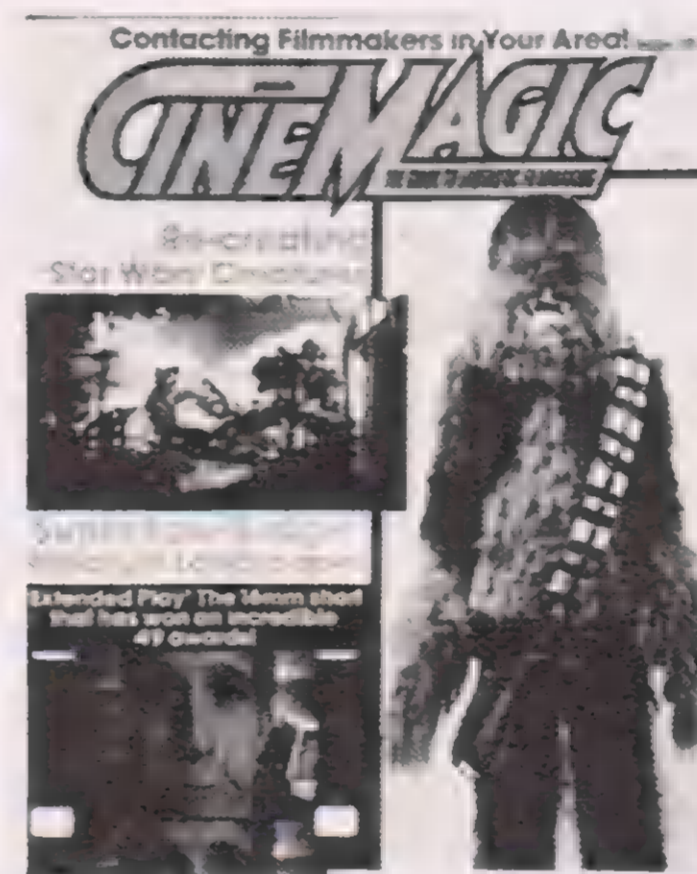
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Please forward announcements of film projects in current production or near completion to CINEMAGIC, c/o O'Quinn Studios, Inc., 475 Park Avenue South, New York, NY 10016. Please include a photograph of some phase of the production if possible.



The Thing in the Back of the Fridge. Inspired by a cartoon in *Mad* magazine which says: "You're never really 100% sure what exactly is in that greenish Tupperware container on the bottom back shelf in your refrigerator." In this movie, an everything-but-the-kitchen-sink type of sandwich is put in the Tupperware, but then forgotten about in the back of the fridge for three weeks. When it is finally brought out, it comes to life and goes on a rampage through the kitchen. Producer: Dinosaur Productions. Director/Writer/Camera/FX: Ben Coxworth. FX include: stop-motion animation, icky-looking stuff, reversed filming and a hidden water hose. Super-8, color, silent (transferred to 3/4-inch video tape with a musical soundtrack). Running time: about five minutes. (Ben Coxworth, 1332 10th St., Saskatoon, Sask., Canada S7H 0J3.)

The Stranger. Horror. A 13-year-old is stalked by a lurker in the trees who begins coming closer and closer—until the boy will never be the same. Producer/Director/Writer/Editor/Camera/FX: Glen Cowan. FX include: slit throats, chest stabbing and supered titles. Cast: Craig Garza, Dan Burns, Shannon Stone, Kim Garza and Denise Cowan. Super-8, color, soundtrack on 1/4-inch tape. Running time: 10 minutes. (Cowan Films, Ltd., c/o Glen Cowan, 6585 Rycroft Dr., Riverside, CA 92506.)

Bigfoot. Bigfoot is a legendary creature to most people, but to Mr. Hooper, he really exist! A small family has just moved into a log cabin in Northern California and are warned of the beast. They ignore the old man and later suffer for it as they are killed by the beast. Two scientists investigate the killings and begin their search for Bigfoot. Shock ending that may be to intense. A Fedele-Film Limited Production. Director/Writer. John Fedele. Cast: Paul Fedele, Bill Fedele, Christina Fedele, and the fanstastic acting of Brian Fedele. FX include: Blood effects, Bigfoot costume and laser beams. Regular 8mm color, separate soundtrack on cassette. Running time: 20 minutes. (RMSN John Fedele COSL Box 100 Norfolk, VA 23511.)



A Resolution. A clay-animated film about a group of creatures who journey to a distant planet to create an alliance with hostile inhabitants. This film is the sequel to my earlier film, *A Future Conflict*. The photo shows me in front of my starfield with two miniatures from *A Resolution*—the mothership Utopia and her shuttle, Starlight. (Holzip Studios, c/o Andrew Koitmaa, 6276 Paso Los Ceritos, San Jose, CA 95120.)



The Hunter. In the 23rd century, police officers are paid on commissions—in other words they have become bounty hunters. This is the story of one of these men. Producer: BC Films. Director/Writer/FX: Bob Cappelletto. Cast: Scott Virzi and Bob Cappelletto. This film is a showcase of my SPFX abilities. FX include: miniature spacecraft and cityscapes, alien makeup, travelling mattes, bullet hits, working props, computer graphics and pyrotechnics. Super-8, color, sound. Running time: 14 minutes. (BC Films, c/o Bob Cappelletto, 1133 Monks Ave., Peru, IL 61354.)



Nightscream. A group of D&D players called the "Dungeon Runners" refuse entry into their group to the neighborhood outcast. Everything seems fine until members of the "Dungeon Runners" start turning up dead, one by one, torn apart by a werewolf. Producer/Director/Writer: Chris Mason. Cast: Jay Mason, Eddie LeRoy, Tim Crother, Cleveland Buckner, James Feenstra and Chris Mason. FX include: complete werewolf transformation scene, latex appliances, full head mask, fog effects, pyrotechnics, numerous death scenes and sound effects. Shot on 1/2 inch videotape, black and white, with a musical and effects soundtrack in addition to dialogue. (Chris Mason Productions, c/o Chris Mason, 1657 Neptune Ave., Wilmington, CA 90744.)

The Severed Head Live at the Hollywood Bowl. The severed head leads the audience on a warm and nostalgic journey through the Hollywood Bowl, the famed Hollywood Letters, and several other popular Hollywood filming locations. Producers/Directors/Writers/FX: Mike and Tom Hutchison. Cast: The Severed Head. FX include: animation and makeup effects. Super-8, color. (Pearls for Swine Productions, c/o Mike and Tom Hutchison, 7620 N. El Dorado #28, Stockton, CA 95207.)



I Dismember Ned—Parts I & II. A young man is terrorized at a remote graveyard by a caretaker who literally becomes an unkillable one-man army who uses power garden tools as his instruments of death. Ned—who has nearly 20 brushes with death within five minutes—has only his wit, strength and several well-placed handguns to aid him in his battle against the fiend. A double-twist ending. Producers/Directors/Writers/Cast: Mike and Tom Hutchison. Super-8, color. Running time: five minutes. (Pearls for Swine Productions, c/o Mike and Tom Hutchison, 7620 N. El Dorado St. #28, Stockton, CA 95207.)

Battle Among the Dead. A story about four teenage youths who set out on a camping trip into the mountains. During their trip to the mountains, they come across a small town. They eventually come into contact with the town's inhabitants. The townsfolk seem very unfriendly and hostile so the youths decide to leave. An unexpected car accident occurs as they leave town. They wake up and find themselves in the town among the dead. Producer: Vaso Babic. Director: John Warner. Writer: Baso Babic. Cinematography John Warner. Special Makeup FX: Richard Meiks. Music: John Warner. Mechanical FX: Craig Meads. Miniatures: Robert Warner. Cast: Steven Taylor, Robert Warner, Mark Koutras, and David Mauch. FX include: graphic violence, miniatures, explosions and stunts. Super-8, color, sound. Running time: approximately 70 minutes. (Lance Productions, c/o Vaso Babic, 236 Mary Street, Richmond. 321 Melbourne, Victoria, Australia.)

A Whisper of Hate. A James Bond thriller in the style of the Connery Bond films of the early sixties. James Bond is sent on a mission to deal with a SPECTRE agent at the casino Royale, unaware of the beautiful traitor at his side. Based on the novel "Casino Royale" by Ian Fleming. Producer/Screenwriter/Director: Christopher Mills. Music by John Barry. Cast: Lance Benner, Andrew Barry, T. Scott Dubay, Shirley Robbins, Maria Willis and many more. Effects: Stunts, pyrotechnics, miniatures, animation, "real" weapons, 'Bondian' titles, computer graphics, full-size sets, and gadgets. This film is intended for private viewing only, and does not intend to infringe upon copyrights held by Glidrose Productions, Eon Productions or any other organization or individual. Super-8, color, post-dubbed sound. Running time: 20-30 minutes. (Christopher Mills c/o Ultra Film/Infinity Cinema Productions, RFD #1 Box 77, Belgrade, ME 04917.)



Night Visitor. An alien craft crashes into a housing project. Four kids battle the alien, a prowler and baby aliens being born in their greenhouse. Producers: Brandon Reynolds and Perry Knowlton. Director: Brandon Reynolds. FX include: slow motion, pyrotechnics and smoke effects, three stages of alien growth, body parts, some gore. Super-8, color, sound. (Brandon Reynolds, 35739 Ballentine Pl., Fremont, CA 94536.)

Rear-Projected Matte Shots

*It's one of fantasy filmmaking's
oldest and most-used techniques.*

By PAUL MANDELL



PHOTO: COURTESY PAUL MANDELL

Dave Carson paints in a section of building on glass in front of the process image at Dave Allen's Burbank studio. Side lights are carefully barndoored to illuminate the painting, keeping the projection "spill-free."

When rear projection equipment was first developed in the late twenties, Willis O'Brien realized that incredible vistas could be created by projecting a small live image on a process screen, placing a sheet of glass (or several glasses) in front of the screen, and expanding the parameters of the image with paint. It saved thousands of dollars of full-scale construction, eliminated the need for exotic locations, and allowed us to gape at primordial jungles that couldn't be replicated today for love or money.

Fifteen years later, the O'Brien team turned the backlot of Pathe into a convincing African veldt for *Might Joe Young*. Looking at the film, few are drawn to the fact that the enormous Golden Safari nightclub, with its treehut musicians and high ceilings, was actually a series of tiny projected images taken on different stages and combined into one grand unit by paintings on glass.

More dramatic uses of the technique come to mind. Long shots of the volcanic conflagration in *The Last Days of Pompeii* were achieved with multiplane glass paintings and projected fire, smoke, and water. The famous closing shot of Charles Laughton in *The Hunchback of Notre Dame*, crying to the gargoyles on top of the cathedral, was a stunning "rear-projected matte shot." Here, Laughton's image was a projection no bigger than an index card. The entire cathedral and Parisian landscape was rendered on glass by Chesley Bonestell. When the camera focused full frame on the miniature projection and pulled back gradually (an "infinite tracking shot"), no one questioned the illusion. Jim Danforth produced a similar shot for *Portnoy's Complaint*, when the camera pulled back from a hotel window revealing the city, and he's made a career of providing films for screen and television with matte painting/process projection composites.

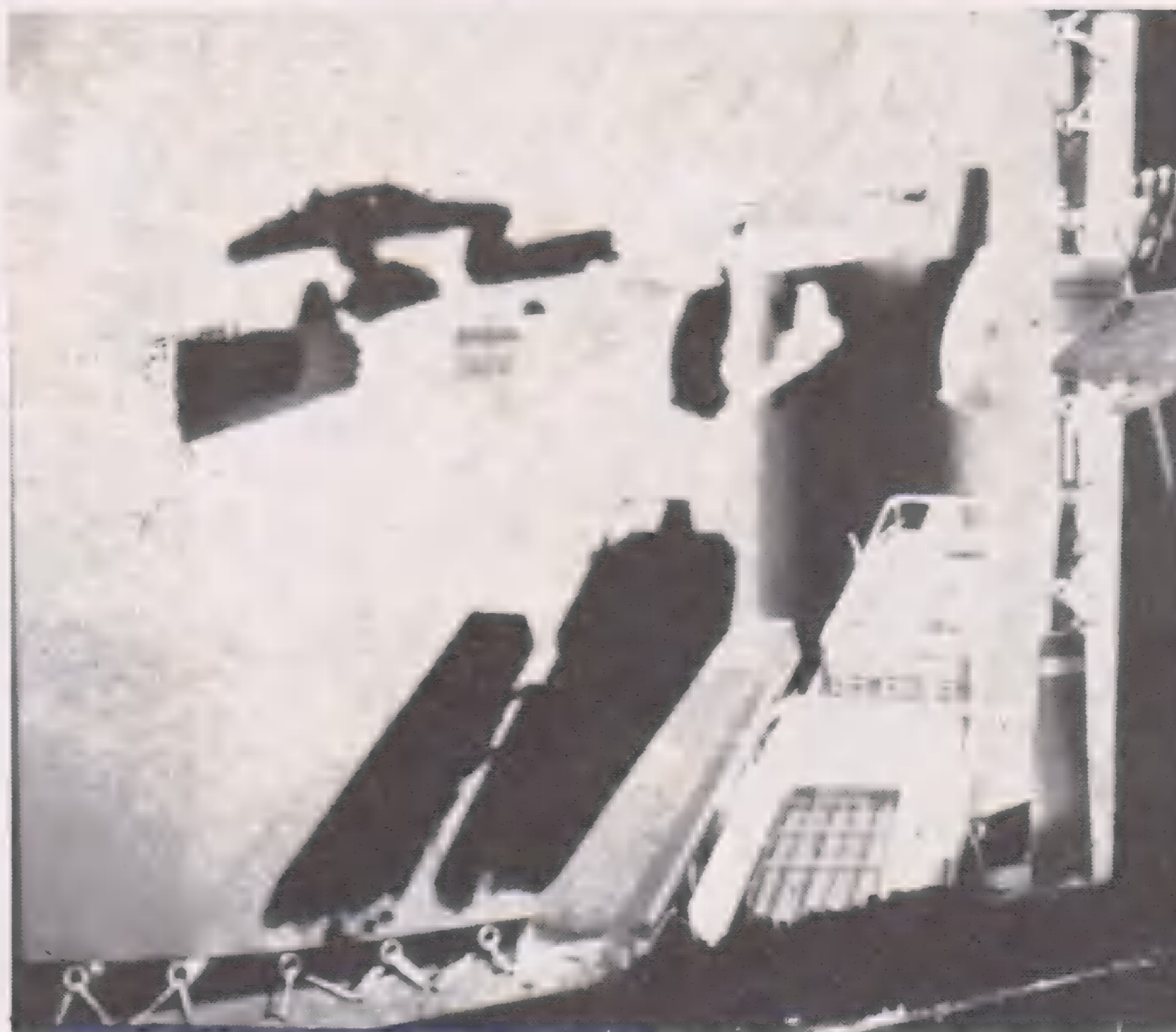
Disney and ILM both use this method when the situation calls for it. Certainly Ray Harryhausen has done his share, augmenting exotic Spanish and Maltese vistas with lush mountainscapes and huge stone heads looming over entrances.

For economy and expediency, the method can't be beat. Often it is indispensable to low-budget films requiring pictorial elements that could not be built or photographed for real.

Such was the case in the 1978 production of *The Day That Time Stopped*, originally called *Vortex*. The effects works was headquartered at the David Allen Studio in Burbank. When Allen's production of *The Primevals* shut down, Allen rented his facilities to cameraman Paul Gentry and supervised most of the work himself. Done on a shoestring budget, it featured some impressive puppet animation by Randy Cook, cel animation by Peter Kuran, and glass art/rear



Carson grease-pencils in an area which he plotted out by looking at the process image through the camera.



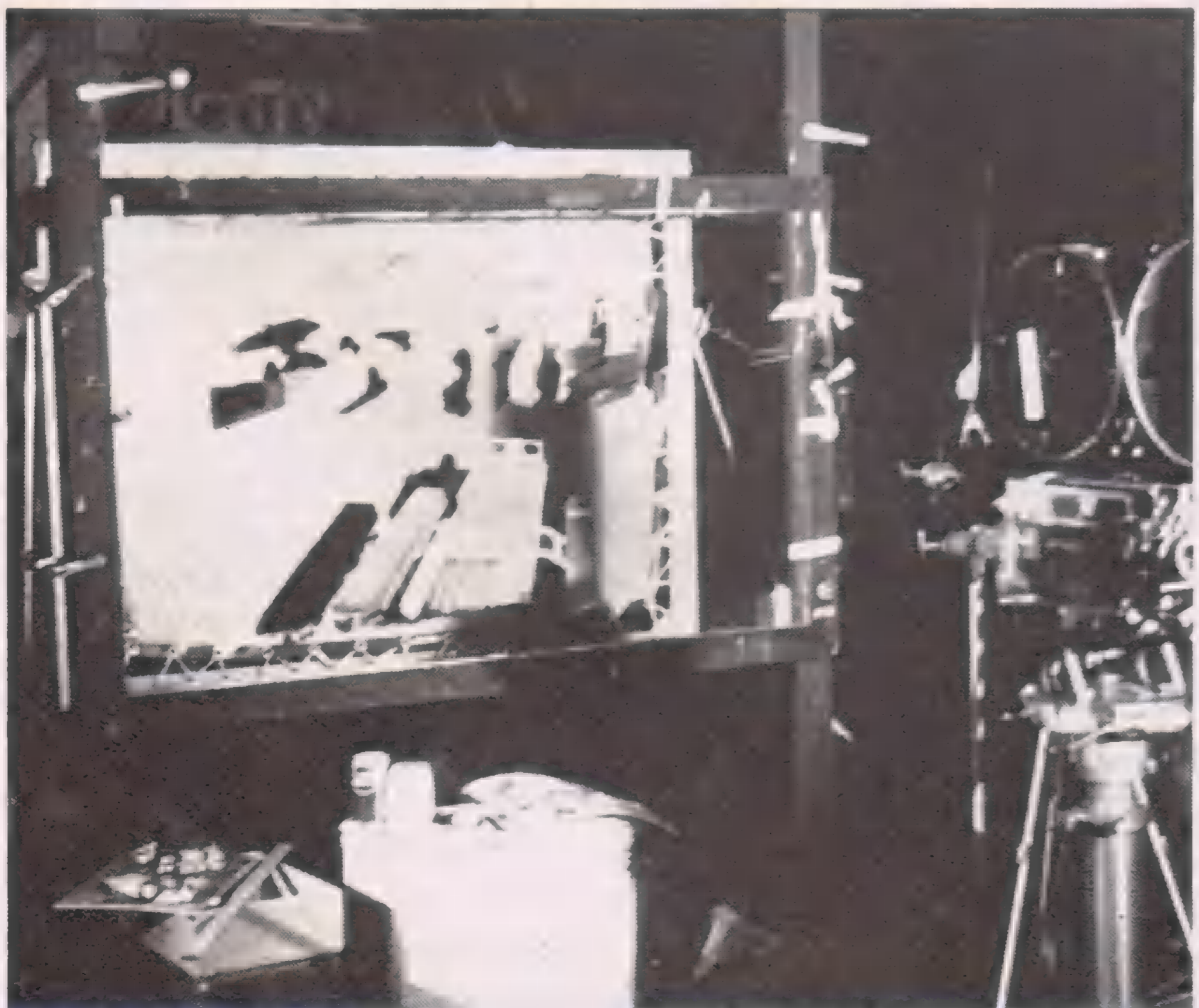
Close-up view of the painted sections. Note the shadows of the painted elements on the screen.



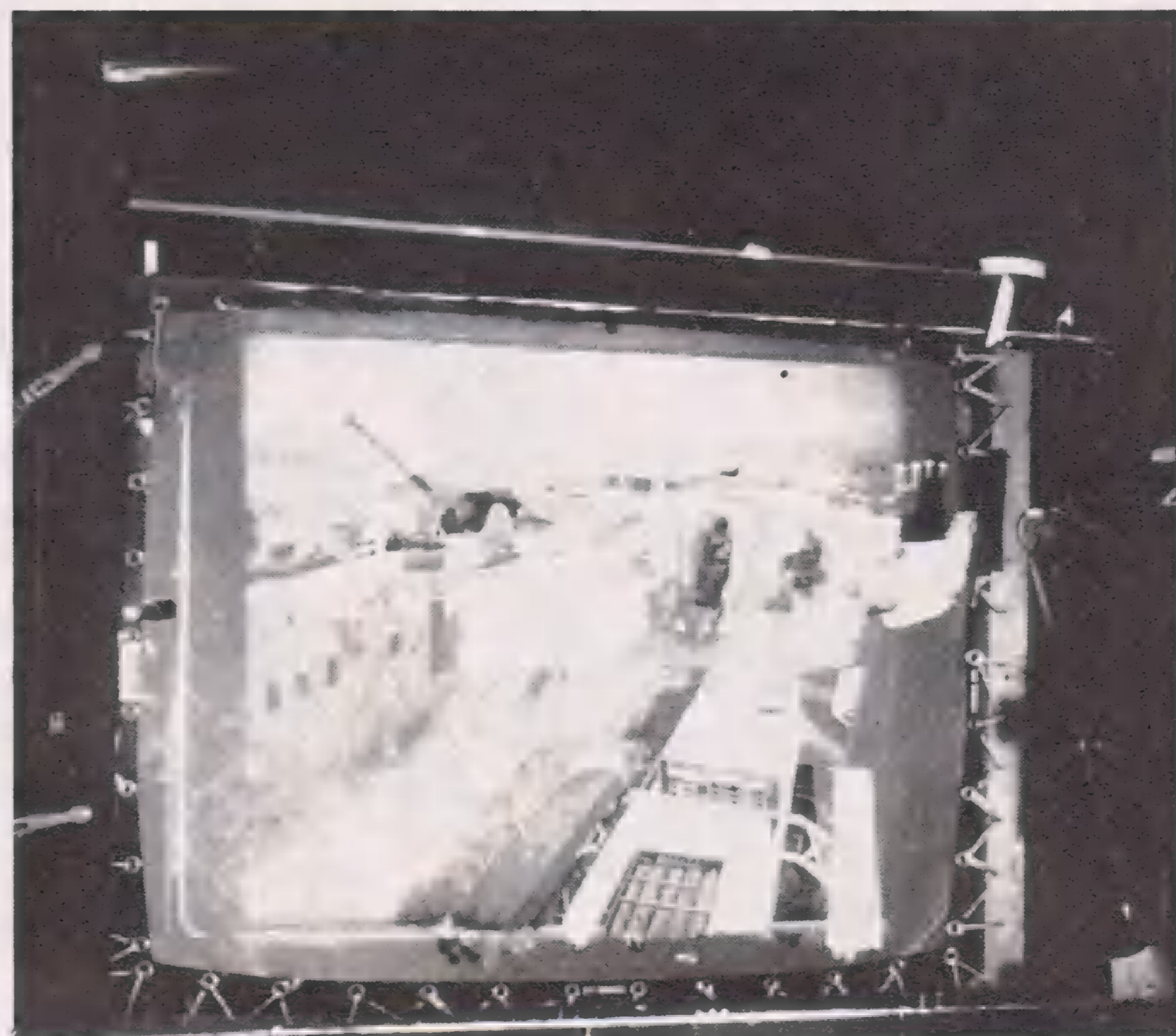
Sections are carefully painted using oils. Colors must match the process image. Carson compensates for the low contrast of the plate by slightly richer color values than those that appear on the projection.



Side angle of the setup showing the distance between the painting and the projection. C-clamps are affixed to the glass frame to ensure stability.



The Mitchell Standard camera photographs the painting with the projection. Here, the projection is turned off. The process screen is grommeted to a frame, and the glass is mounted in an H-frame.



View of the incomplete painting against the process image.

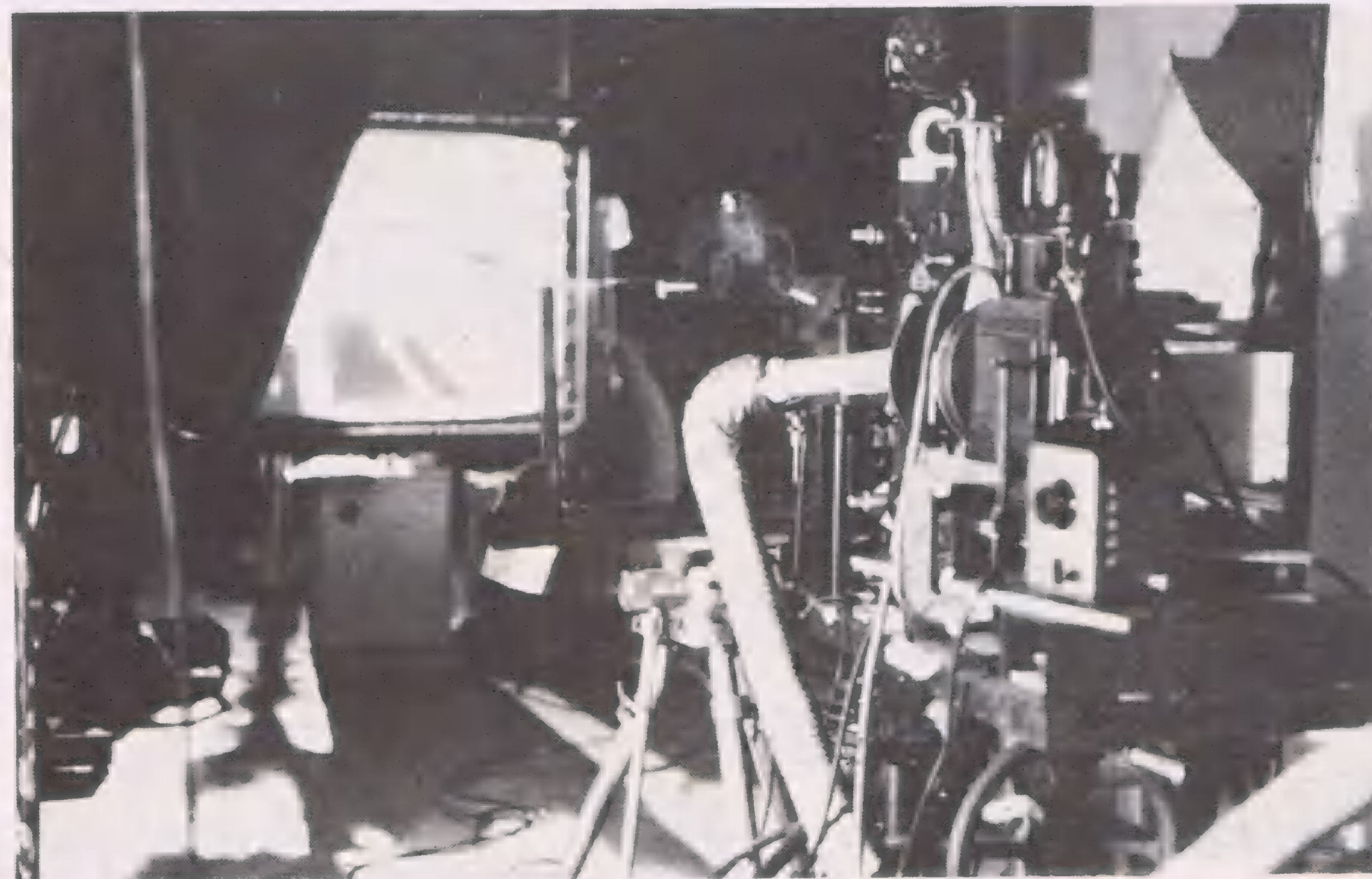
PHOTOS: COURTESY PAUL MANDELL



Painting near completion. Note black tape on the process screen seen through the glass, used as a reference point for the painted fuselage.



Cameraman Paul Gentry prepares to photograph the final effect.



View from the rear of the setup. Side lights illuminate the process screen, though no image is being projected. Note extraordinary cooling tubes coiled around Dave Allen's rear projector, which is as big as a baby elephant.

projection composites by Jim Danforth and Dave Carson.

Illustrated here is a revealing look at what the setup looked like from all angles, *while* the shot was being created. Dave Carson (now an ILM crew member) was called upon to add fragments of buildings and futuristic machinery to a scene filmed in the desert. The footage was projected onto an old Stewart process screen (Ray Harryhausen for many years has used the same) in front of which was mounted a sheet of glass in an H-stand frame. Looking through the rack-over Mitchell camera, Carson carefully plotted points on the glass with a grease pencil, delineating the geometry of what was to be painted. Working from drawings and photographs, the elements were designed in forced perspective.

Then Carson rendered them on glass with oils, carefully marrying his hues to those on the process plate. This can be very tricky, for the projection is usually soft to compensate for contrast buildup during rephotography, while the painting is a first-generation image. Part of the matte painter's skill is knowing how to blend tonal elements of background and foreground in a process situation, and compensating for color balance by eye.

For maximum definition, of course, the frontlight/backlight system is generally used, where the painting is aligned with the background, photographed separately, and printed with the background using a silhouette matte of the painting. But in low budget features, the cost of the process is prohibitive. A single short FL/BL shot can cost as much as \$1500 in optical work. Skip-framing the painting to frontlit and high-contrast matte rolls, exposure-wedging and test-printing the composite can deplete any modest effects budget.

Not so with glass art in front of rear-projected backgrounds. The obvious drawbacks are a loss of background quality (critical in color, not black and white) and the inability to fine-tune painting and plate separately. How *much* quality is lost depends on screen resolution, lighting, the wedging of the background footage and the expertise of the personnel involved.

Money is not always the deciding factor. Albert Whitlock hates projected matte shots, while others prefer its instantaneous results. Once, I discussed the advantages of the front light/back light method with Jim Danforth. His response was, "Yeah, but it's so *nice* to have your foreground and background image right there in front of you. When you do this stuff for a long time, you *know* what the result will look like, right through the camera."

Ray Harryhausen has been using this technique since *The 7th Voyage of Sinbad*. Who can argue with a track record like that?

CM

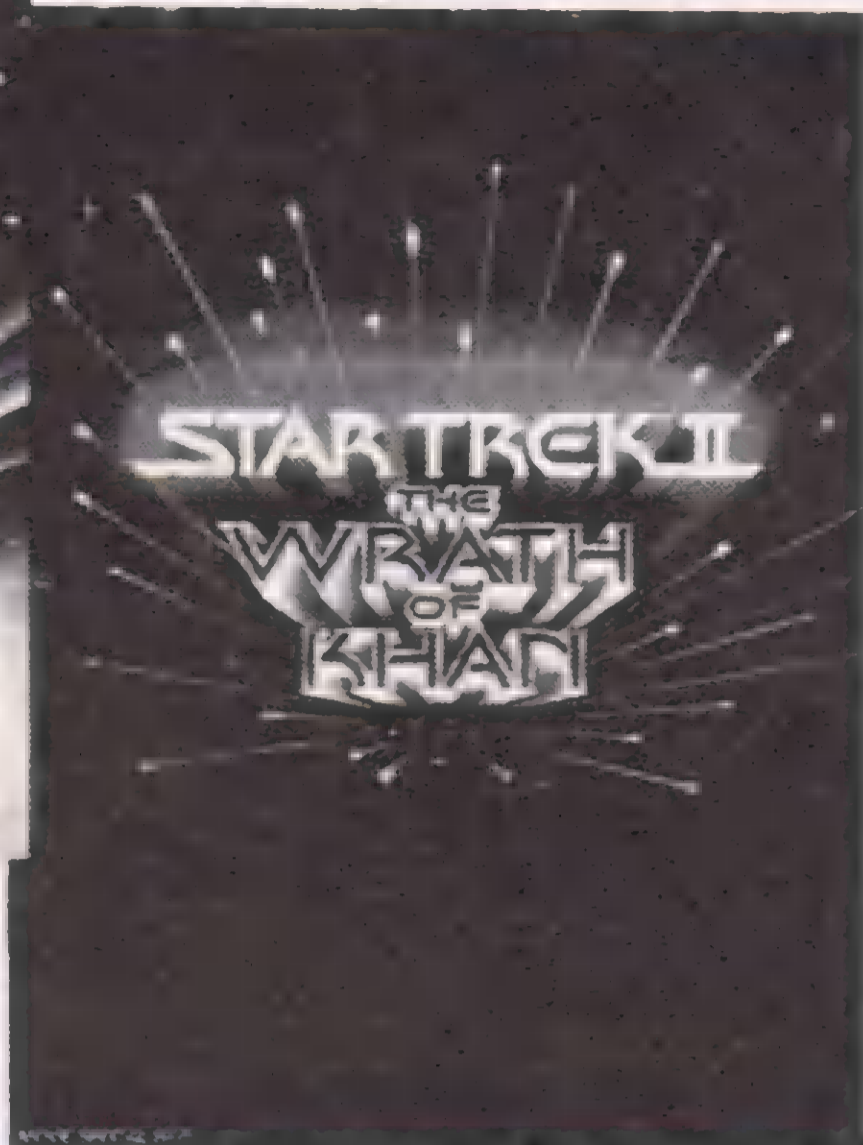
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Filmmakers' FORUM

A regular department devoted to readers' comments about filmmaking, their problems and solutions.

Laudati Wins Student Oscar

... Animator Tony Laudati, whose film *The White Gazelle* was featured in the last issue of CINEMAGIC, has won the National Academy of Motion Picture Arts and Sciences' "National Animation Achievement Award". *The White Gazelle*, which Laudati made as a student at the State University of New York at Purchase (SUNY Purchase), was the film for which he won the award. The film showcases Laudati's talents as an animator and features some split-screen rear projection work that makes his stop-motion allosaurus model appear to be walking *behind* some of the

foreground elements in his rear-screen process plate. For more about Laudati's innovative 16mm film see John Dod's article, "Filming *The White Gazelle*" on page 30 in CINEMAGIC #26.

Laudati won an all-expenses-paid trip to Los Angeles as part of his prize and was given the opportunity to meet and show his demo reel to several top film industry people.

Contact Filmmakers!

... You can contact filmmakers whose work interests you or who happen to live in your area, simply by writing to them at the addresses listed with their letters.

CINEMAGIC encourages filmmakers to contact each other and possibly collaborate on projects. For more names and addresses, see Producers' Bulletin Board

Contacting Corman

...After reading the article in CINEMAGIC #24 on Roger Corman's Millennium Pictures, I became interested in writing to them. I spent hours in the library and on the phone trying to track down an address to write to but I was unable to find anything. Will you please print a mailing address for Millennium, I would really appreciate it.

Mick Alderman
Rt. 3 Box 161
Atoria, OR 97103

...Unfortunately, we cannot print mailing address of well-known filmmakers or their studios, but we would be happy to forward your letter for you. The name of Corman's studio recently changed to New Horizons.

Dallas Filmmakers Needed

...I have a big problem. One month before I start production on my first "big" movie my camera decides it wants to eat film. So here is the deal: I need any and all Super-8 filmmakers and enthusiasts in the Dallas-Fort Worth area. I won't say what the production is (you'll have to call to find out) but I need help with the filming, FX, set building, costumes, editing and transportation. I myself am a makeup artist and jack-of-all-trades filmmaker. It's not a long film but it is extensive, if you are interested call me or write to the address below.

Tom Lilliamson
1903 N. Mill #3005
Lewville, TX 75067
(214) 221-5920

Looking for a Partner

...I am a new filmmaker, who lives in the Bayside, Flushing area of New York. I have my movie ready to roll except I need a partner. If there are any new filmmakers in the Bayside, Flushing area please write or call the number below.

Andrew Hernon
29-56 172 St.
Flushing, NY 11358
(212) 353-6288

Film Magic

...I'm a beginner who wants to learn about animation technique but can't! I really want to make animated films more than anything else, but I can't go beyond plasticene models that fall apart like a madman because I don't know how to build armatures.

CINEMAGIC first attracted my attention when I read an article



Tony Laudati poses with some of the stop-motion models from his film, *The White Gazelle*.

on Microcomputer Animation in issue #23. Looking through the back issue page, I ordered six of them, hoping that they would help me somehow. I was hoping to learn glass shots, front projection, armature construction, miniature set construction, and other techniques usually associated with stop-motion animation and miniature FX.

In the back issues of CINEMAGIC I received, I noticed an ad for an FX book called *Film Magic*. Since this ad appeared in an older issue (#10), I was just wondering if there are any copies still available.

Tony Asimakopoulos
2840 Louisbourg Terrace
Montreal, Quebec
H3M-1L6 Canada

...*Film Magic is available from Cinema Enterprises, 12 Moray Ct. Baltimore, MD 21236. The book was compiled and edited by Don Dohler, founder of CINEMAGIC. Also see the article about Jimmy Picker's Sundae in New York in this issue for a look at Plasticene models that don't fall apart.*

Rear-Screen Mattes

...I make animated films, and for my next stop-motion film, I desperately need information on how to make live action appear in front of the animation model, using the rear-projection screen technique. The movie is in preproduction and I want to learn how to do this technique before I start animating.

Francisco Gonzales
2741 So. Christiana
Chicago, IL, 60623

...*See Paul Mandel's articles, "Rear-Projected Matte Shots" (page 43) and "Split-Screen Dynamation Technique" (page 34) in this issue. You have to be shooting at the very least in the 16mm format for the technique to work convincingly. Also see "Filming the White Gazelle", which covers filmmaker Tony Laudati's use of rear-screen matte shots, in issue #26.*

Iowa Film Group

...We are looking for filmmakers, in the Davenport/Quad Cities area of Iowa for possible collaboration on future film projects. We at R.B.L. Productions have been working on horror/suspense movies and some amateur rock videos. We are hoping to expand and are putting out a brochure. Anyone interested can contact Robert Long II at the address below.

R.B.L. Productions
c/o Robert Long II
1026 Arlington St.
Davenport, IA 52803

Call For FX Artists

...I am 12 years old and new to filmmaking. I'm currently working on a comedy spoof of *Star Wars*. I need someone who can create good laser beam effects. Anyone who is interested—especially if you live in the Yonkers area—please contact me at the address below.

Michael Battista
790 Tuckahoe Rd.
Yonkers, NY 10710

Wisconsin Film Club

...We at Wellington Studios Film Club have just formed our film club and are looking for members. Unlike many other film clubs, we are lacking several things—namely members and equipment. We would like anyone in the St. Croix, Pierce or Polk County area of Wisconsin who is interested in filmmaking to contact us. We are interested in hearing from anyone interested in acting, scriptwriting, special effects, editing, animation, costumes, set design, directing, producing, or any other aspect of filmmaking. Please write to the address below and more information will be sent to you.

Wellington Studios Film Club
c/o Troy LaFaye
Box 198
Hammond, WI 54015

Twenty Questions

...I'm a beginning filmmaker with loads of questions to ask, but for now I'll just ask a few that I desperately need answered. Can you tell me where I can get large or small quantities of modeling clay and what kind of tools to use? Can you also tell me what Sculpey is? Where can I get fiber optics?

Al Schmeer
27 Ridgecrest Lane
Waterbury, CT 06708

...*Sculpey is a brand name for modeling clay. For the types of tools to use, see Ken Brilliant's article, "Sculpting in Clay" in this issue. For supply sources for both modeling clay and fiber optics, see John Dods' "Supply Sources" list in this issue (Edmund Scientific sells fiber optics).*

Film Schools

...After watching the program *Lights, Camera, Action* I became interested in the movie/video making process. I am currently a senior student in architecture, and have found many similarities between movie making and architecture, which sounds logical since they are both team efforts.

Please, send me some information about movie and video making and any school or training institute that might offer some training or intro courses in the Filmmaking.

Nejim Alkhatib
5702 50th St. (#267)
Lubbock, TX 79414

...*Send for The American Film Institute Guide to College Courses in Film and Television. The book, which is published by Peterson's Guides, lists virtually every college in the United States that offers a film or television curriculum—as well as listing some schools in foreign countries. The book is highly recommended to anyone trying to choose a film school and may be ordered prepaid from: Book Order Department, Peterson's Guides, Dept. 7591, P.O. Box 978, Edison, NJ 08817. The price is \$11.50 plus \$1.25 postage and handling—and well worth it!*

NJ Film Group Forming

...I'm a filmmaker with four years of film school and some professional experience. I've noticed that there are talented individuals who wish to work on films, also achieving quality. I believe that I'm not only speaking for myself when I express here that I'm not necessarily forming a club, but a group of talented and serious individuals who are interested in making films as a career. I need people who specialize in various areas such as cinematography, art design, acting, costume design, FX, music and other jobs related to filmmaking.

If any CINEMAGIC readers who live in the New Jersey area are interested, write me at the address below. My aim is to put together a quality film "group" and help each other achieve our eventual goals. Filmmaking was born in New Jersey by Thomas Edison, lets bring it back home!

Annalisa Productions Ltd.
c/o William Currier Rose
1323 Rariton Ave.
Manville, NJ 08835

Ocean County, NJ Film Club

...I would like to call attention to potential and established filmmakers in the Ocean County, New Jersey area in hopes of creating a filmmaker's club with a special interest in science fiction, action, adventure and the like. The club bends toward original stories and imaginative recreations of such classics as the old *Twilight Zone* and *Outer Limits* episodes (if we can get permission to so). But we will do

just anything as long as it's good. The club will be mostly for those in their teens and early twenties, so that we will be able to work as equals (I am 14).

However, I would greatly enjoy and appreciate the advice and possible a working relationship with older, more experienced filmmakers of the area. We will deal with every aspect of filmmaking: scripting, set building, lighting, makeup, costuming, casting, etc. So if someone you know would be interested please respond to the address below.

Tim Dunphy
960 Fairview Dr.
Toms River, NJ 08753

Rear Projection Tip

...My name is Randy Zastrow and I am co-producing the special visual effects with my friend David Petri for Banshee Films' *Battle Between the Wizards*.

During preproduction I came upon an interesting theory. I thought that if you put your rear-projected image out of focus just a tad, you would eliminate the graininess of the background on your final print.

So I tested it and found that it worked to my exact specifications. I also found that it could also be applied to another process of mine that could easily be called "rear projected cel animation." It eliminates the need for expensive optical printing and computer technology.


Anyway, David and I got our heads together and gave this process a name. "Fantascope" had been born with an offspring called "Fantamation." (rear-projected cell animation.)

Readers interested in obtaining full details should write to the address below.

Randy Zastrow
901 Drake St.
Denver, CO 80211

CINEMAGIC Writer's Guide

...The CINEMAGIC Writer's Guide is now available. If you have an article in mind for CINEMAGIC and would like to know what we expect to see from our writers, send a self-addressed, stamped envelope (business #10 size) to the address below.

CINEMAGIC Writer's Guide
475 Park Ave. So.
New York, NY 10016 

Address all correspondence to: CINEMAGIC—Filmmakers' Forum, c/o Starlog Press, Inc., 475 Park Ave. So., New York, NY 10016.

Due to the enormous volume of mail received, the editor regrets individual replies are impossible.

Picker

(continued from page 19)

work, because animating the camera movements as well as the characters takes much more time and is more difficult than just shooting stop-motion with a locked-down camera—but the improved quality of the finished film makes all of the extra effort worth it.”

Despite his success with *Sundae in New York* and the very favorable reception that *Jimmy the C* received, Jimmy Picker has no plans to make any more clay-animated films featuring famous politicians. “It’s very risky making clay-animation films with caricatures of famous politicians. There’s always the possibility that something could happen to them. I wouldn’t recommend it to anyone. I did *Jimmy the C* and *Sundae in New York* because they happened to be good ideas at the time, so I decided to cross my fingers and hope for the best. Fortunately, everything worked out. It takes so long to make a clay-animated film that it’s not really worth risking such a huge investment in time to make a film whose humor could be destroyed by something terrible happening to the politician you’re caricaturizing.

“Another important thing to remember—if you’re going to make this type of film at all—is to keep them cute and sweet and not do anything derogatory, or the film won’t sell. You can enjoy both *Sundae in New York* and *Jimmy the C* regardless of whether you love or hate the particular politician. If you hate Koch you love the film because he gets thrown into a garbage truck, if you love Koch you enjoy the film because he’s an entertaining character. The same thing is true of *Jimmy the C*: if you hate Carter you love the film because he’s a silly-looking little puppet but if you like Carter you enjoy watching him sing such a sentimental song as ‘Georgia On My Mind.’ The Carters saw the film and I heard that they really enjoyed it.” Of course you’ll enjoy Picker’s fascinating clay animation and humorous musical comedy no matter how you feel about these politicians.

“We have a record of the *Sundae in New York* soundtrack in distribution in New York area, and it’s getting some airplay on a few local radio stations.” Picker reveals. “The flip side is the same song done in Spanish. Of course when you do a film like this you have to secure synchronization rights to the song. I just used a Ray Charles recording for the soundtrack of *Jimmy the C*, but of course I had to make my own recording for *Sundae in New York*. I put an ad in *Backstage* (A New York trade paper for the entertainment industry) in order to find the voice talent to do Koch’s voice. I auditioned about seven people before I found



PHOTO: JOHN CLAYTON

Jimmy Picker's studio in Brooklyn, New York is filled with clay characters and miniatures from *Sundae in New York* and his earlier film, *Jimmy the C*.

Scott Record, who does a wonderful impersonation of Koch. Scott is a stand-up comic and he has opened for lots of top acts like Frank Sinatra and Rodney Dangerfield. Andy Stein was the musical director and he did a terrific job of arranging and recording the soundtrack version of ‘New York, New York.’ Andy is a top flight musician, he’s worked with lots of bands and appears regularly in clubs around New York City.”

Picker is an N.Y.U. Film School graduate and he spent many years working in the business and learning the tricks of the trade before his Oscar for *Sundae in New York* brought him to national attention. “I taught myself animation but had never learned to sculpt. After I graduated from film school I was lucky enough to get a job with an American firm that specialized in clay animation. When the company moved to Germany I went with them and it was during my one-and-a-half years in Munich that I learned how to sculpt and animate clay. I fell in love with how clay animation looks on the screen and when I came back to the U.S. I opened my own studio in Brooklyn and began producing clay animation on my own.

“Because filmmaking is such a collaborative art and because I worked on projects with other people—and especially because clay animation takes so long—there’s not a huge body of work I can point to and call my own. There are a few other things that I animated on my own that people may recognize. One of the first jobs that I did on my own was for the TV show *Electric Company*. I animated about 20 spots for *Electric Company* featuring a character named Clayton, which were made to help teach kids how to read and write. I also did an obesity spot for the Will Rogers Foundation which has been widely shown on television. The obesity spot shows a little

fat guy running into a pizza parlor, an ice cream parlor and a bakery and buying everything in the store. He then waddles back home and eats all the junk food that he’s bought as he sits and watches TV. A doctor comes on the TV and lectures to him about the evils of being fat, so he goes to the park and jogs and loses all his extra weight. At the end he meets two girls and lives happily ever after.

“Winning the Oscar was great because it has opened a few doors for me, but I still have to generate my own ideas for new projects,” Picker confides. “I now have an opportunity to try my hand at directing a feature and I’m exploring that possibility by developing properties with a few writers that I’ve come in contact with. The feature would have to be live action because the track record shows that animated features don’t make money and there aren’t many producers willing to gamble their money on an animated feature. I’m excited about being able to branch out and direct live action. I’m also interested in doing a clay-animated holiday special for television. I love working in clay animation and I’d rather tell a half-hour story than do short commercial spots. I think I can breathe new life into the clay-animated Christmas special genre and add a touch of humor that I think is lacking from the dimensional-animated specials I’ve seen.”

Jimmy Picker is finally in a position, after years of hard work, to attract producers to back his own personal projects. As people who are familiar with his work already know, he is a very gifted filmmaker whose work deserves the attention it is finally getting. *Sundae in New York* can currently be seen sporadically on cable channels such as HBO and Showtime and in certain movie theaters (like the “A” Street Playhouse and Cinemas I and II in New York) that exhibit short films.

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Sculpting In Clay

By KEN BRILLIANT

In the world of stop-motion animation models, sculpting is a powerful technique. Sculpting in clay over the armature can give you the ultimate control over how your model will look. You can do extremely fine and realistic detailing or make minute, subtle changes — changes that would be difficult with other construction techniques such as the “build-up” method that I described in CINEMAGIC #21.

Unfortunately, to take a lump of clay and turn it into a finely sculpted model is not easy. Hopefully this article will make it easier by familiarizing you with some of the tools and techniques used in sculpting. The techniques described in this article, although demonstrated on stop-motion models, can easily be applied to other areas of special effects such as mask making, creating latex appliances and more.

Sketching It Out

Before I even touch any clay, I like to make a fairly detailed drawing of what I plan to sculpt. This is very important. I usually go through many different designs and concepts before I come to the one that will serve as a guide for my sculpture. These drawings are helpful in determining skin texture, proportion and getting a concept that I can stick with.

The alien shown in this article probably would have been sculpted many more times than it was if I hadn't gone through the different designs on paper. It's not essential that you stick to the drawing. In fact, the sculpture will most definitely be different from the drawing in some way because what looks good on paper doesn't always translate well to clay. But the drawing does give you a concept you can start with.

Materials

One of the first materials you'll want to consider getting is clay. The type of clay that should be used is plastiline clay. Plastiline is an oil base clay, which means that it will remain permanently pliable. There are a few brands of plastiline clay on the market and they come in various colors, consistencies and prices. I like to use Roma Plastilina. It is a high quality clay and comes in four different hardnesses: number one being the softest and number four the hardest. Number one is good for the initial cover-

(continued on page 64)



The basic materials and tools needed to get started: plastiline clay, various sculpting tools, cold cream and rubbing alcohol for smoothing the sculpture. All clay and sculpting tools were purchased from Sculpture House in New York City.

PHOTOS: KEN BRILLIANT



ART: KEN BRILLIANT

Before you begin your sculpture it is important to work through your basic design ideas as pencil sketches; these can be any number of quick "thumbnail" sketches of various points of view, but should also include a fairly detailed final rendering.

On LOCATION

The Making Of RAYGUN'S NIGHTMARE

Filmmaker Peter Wallach assembled a very talented crew of effects artists and created an amazing film that pits Ronald Reagan against a Godzilla-like monster made of Japanese car parts and high-tech electronic gear.

By JOHN CLAYTON

Ronald Reagan is the most visible figure in the world these days, and among the most satirized. Filmmaker Peter Wallach has created a great little film featuring the famous turkey-necked caricature of the president. Wallach's short film, *Raygun's Nightmare*, capitalizes on Reagan's B-movie cowboy image.

In the film, the President faces the dreaded Japanese "Import Monster" in single combat, after a squadron of U.S. Air Force F-16's and an armored division of M-1 tanks fail to stop the Godzilla-like behemoth.

The robot monster is made out of Japanese car parts, television sets and other high-tech electronic gear. The monster flashes advertising signs bearing the names of Japan's most famous giant corporations. In retaliation, Reagan dons his ten gallon hat and buckles on his Colt 45 to stop the Japanese B-movie monster from trashing the government buildings in the Capitol.

Everything about *Raygun's Nightmare* is simply brilliant. It has to rank as one of the most entertaining short films to come along in many years. One of the greatest things about the film is that it has fun with so many different topics at the same time. It is simultaneously a parody of American B-movie westerns and Japanese B-movie monsters. It is also a brilliant political satire of the threat to the American economy posed by the trade imbalance with Japan. But mostly, it's just plain fun.

The effects in *Raygun's Nightmare* are a masterful blend of bits of cinematic sleight-of-hand. There is wonderful stop-motion animation featuring a clay Reagan in a miniature oval office. The brilliantly shot live action features great Reagan prosthetic-appliance makeup, knee-high miniature buildings that break away on impact, blinding miniature explosions and the incredible Import Monster. Virtually every filmmaking technique comes into play during the course of the six-minute film.

In addition to stop-motion animation and live action with miniatures, there's



The dreaded "Import Monster" breaks off the top of the Washington Monument and smashes it over Reagan's head in a scene from *Raygun's Nightmare*. Note the snout made of car parts.

also cel animation which is optically added to enhance the stop-motion animation. There are even in-camera deathray effects that come shooting out of the Import Monster's menacing television-set eyes. It's the kind of film you want to watch over and over again to study how all of the effects were done.

Birth of a Monster

"The concept for *Raygun's Nightmare* originally came from a meeting that art director Michael Sullivan and I had with the film's producer, David Jablin," Peter Wallach begins. "I had done an earlier film for Jablin with Jimmy Picker (see the article on Jimmy Picker's stop-motion political satire in this issue) entitled *Reagan's Rap*, which was a stop-motion film of Reagan in the oval office singing a "rap" song. Jablin, Sullivan and I went over to Sullivan's place, which you'd have to see to believe. Mike's apartment is filled with his amazing creations: miniature buildings, sculptures of aliens, stop-motion models and the like. Mike showed us his Godzilla monsters and his other creations and the three of us started brainstorming—the idea was born then and there.

"Jablin went back to California and worked up a first written treatment of what we had discussed with a writer friend of his named Lee Biondi. When Sullivan and I got the treatment, we went to work on storyboarding the film—making various changes with our own new creative ideas. The script was also loosely based on the materials we had on hand—Mike's beautifully crazy creations and my own collection of miniature stop-motion props.

"It became a sticky issue later when Mike and I were denied any writing credits on the film just because neither of us happen to belong to the Screenwriter's Guild. We're visual artists, but that doesn't mean we're not storytellers. Mike and I are responsible for a great deal of the storyline and totally responsible for the finished look of the film. We came up with bits of animation that we thought would be fun and all those little bits of animation obviously wound up in the film as action supporting the storyline.

"It's a good practice to protect your ideas by jotting them down and sending them to yourself via registered mail. When you get the letter back, keep it sealed and put away. Then, if someone tries to claim that your ideas were actually his, you have a record of when you actually came up with the idea.

"The design of the Godzilla 'Import Monster' came from a drawing Sullivan worked up," Wallach continues. "A very talented costume designer named Valerie McNeal made the Godzilla suit based on Mike's drawing. The parts came from around the corner on Canal Street, which is a street here in New York where you can find all sorts of junk that's great for making props with. We used radio parts,

vacuum tubing, circuitry boards and the like, all pop-riveted together. Sullivan and I made the head, which was partly inspired by Picasso's sculpture of a baboon. The Import Monster's snout is made of model car parts. We added our own touches, such as using two working mini TV sets for the monster's eyes and rows of rifle bullets for teeth.

"I didn't care what was on the little screens, I just thought that having little images in the monster's eyes would add a little extra visual impact. The images in the monster's eyes are just whatever was being broadcast when we were shooting the live action in the studio. There were a couple of inserts of closeups of the monster's head that were animated, and the TV set eyes look really wild in these shots because of the amount of time between each frame."

There are all sorts of great little touches in *Raygun's Nightmare* that raise the production value of the film immensely. A TV set in the miniature oval office set gives a live-action news bulletin of the monster's progress during an animated dolly short that tracks from the TV screen to the animated Reagan puppet at his desk. The newscast was rear-projected frame-by-frame onto the miniature TV with a Kodak Analyst projector. The incredibly realistic-looking miniature explosions and the deathrays that shoot out of the Godzilla Import Monster's TV set eyes are pure movie magic.

Low Budget Effects

"Both the deathrays and the blasts from the tank cannons were done in-camera using a beam-splitter technique," Wallach reveals. "We mounted the monster's head on a tripod head and animated it simultaneously, adding the deathrays by means of a beam-splitter. We used 26 pieces of matte board fit into our beam splitter rig to create the deathrays. We zig-zagged lines in freehand on the different pieces

of matte board and then we cut the line out and backlit them, incorporating them into the shot by lining them up in the beam-splitter rig.

"The great thing about using a tripod head to animate the closeups of the monster's head is that it can mimic all the movements of your own head: it can rotate, it can move up and down and it can tilt and yaw. Of course, we had to reposition the rays for each frame to line them up with the monster's eye's as we animated the head.

"Basically the way a beam-splitter shot works is you have a partially-silvered, front-surface mirror that sits at about 45 degree angle to the axis of the camera lens and you setup a light box that will reflect your backlit artwork off of the mirror and into the rest of the frame that the camera is recording simultaneously. Because we cut out the little lightning bolt deathrays on black matte board, the only light being reflected into the scene through the beam splitter was the backlit ray itself. The ray is reflected off the front of the glass, so by changing the degree that the glass is at you can line up the ray with the monster's eyes. The beauty of this technique is you see exactly what you will get right through the lens on the set—and you save a fortune by doing it in-camera instead of adding it optically later on. The fact that the rays are slightly out of focus actually helps, because it softens them a little and you don't get such a sharp line. There's a great deal that you can do with a beam splitter. We did virtually everything in-camera and only had to use my animation stand for a few optical shots.

"One thing I'd like to point out to CINEMAGIC readers is that the beam-splitter technique can be done on a shoestring budget and it gives fantastic results. We used a \$75 front-surface mirror, but we also shot a test with a two-dollar piece of glass—and there was vir-

(continued on page 52)



Our cowboy hero President comes to the rescue in *Raygun's Nightmare*. The 13-foot-wide Capitol building miniature is mostly foam core with plaster detailing. The break-away dome is plaster.

Soundtrack Spectacular



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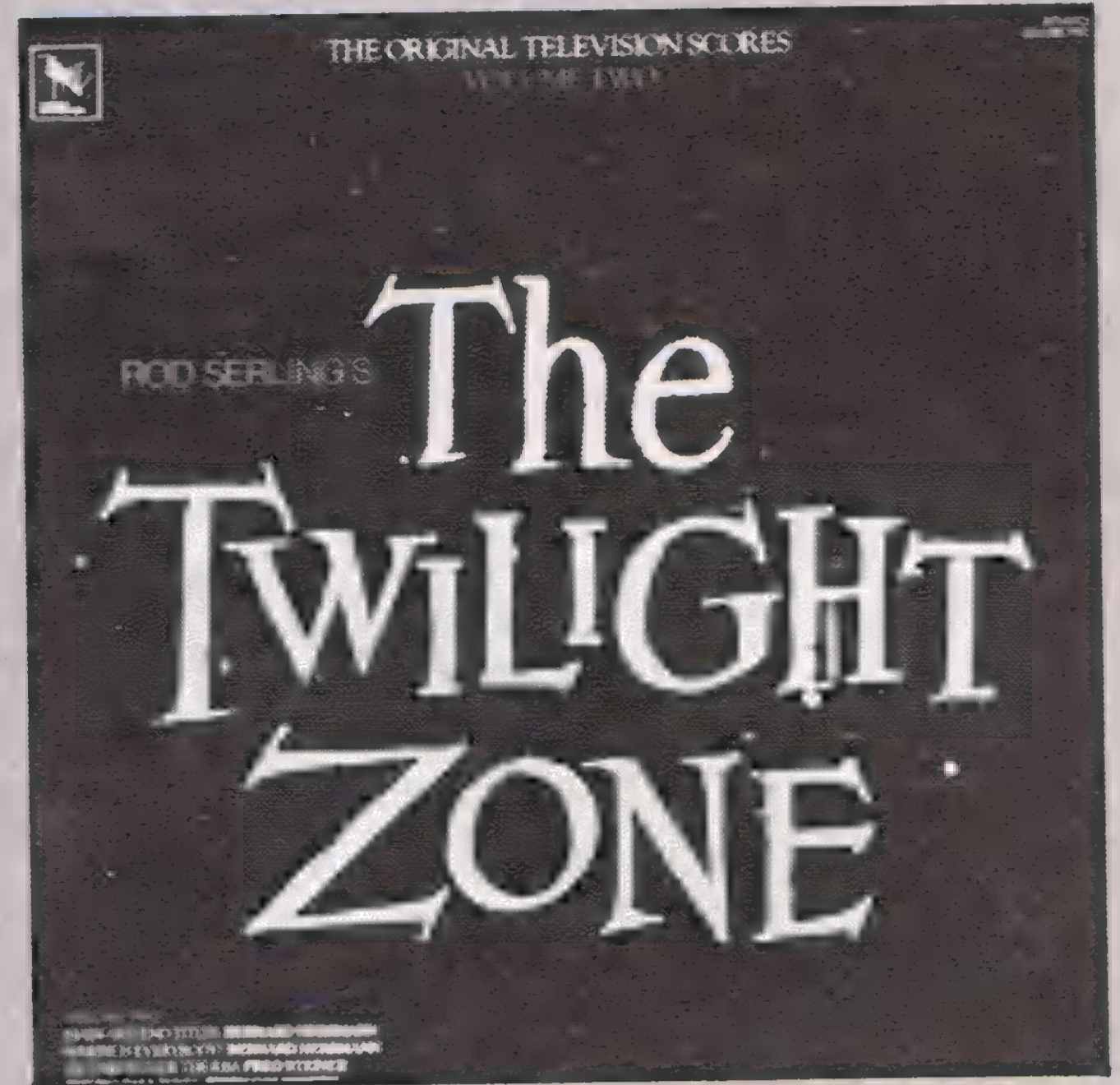
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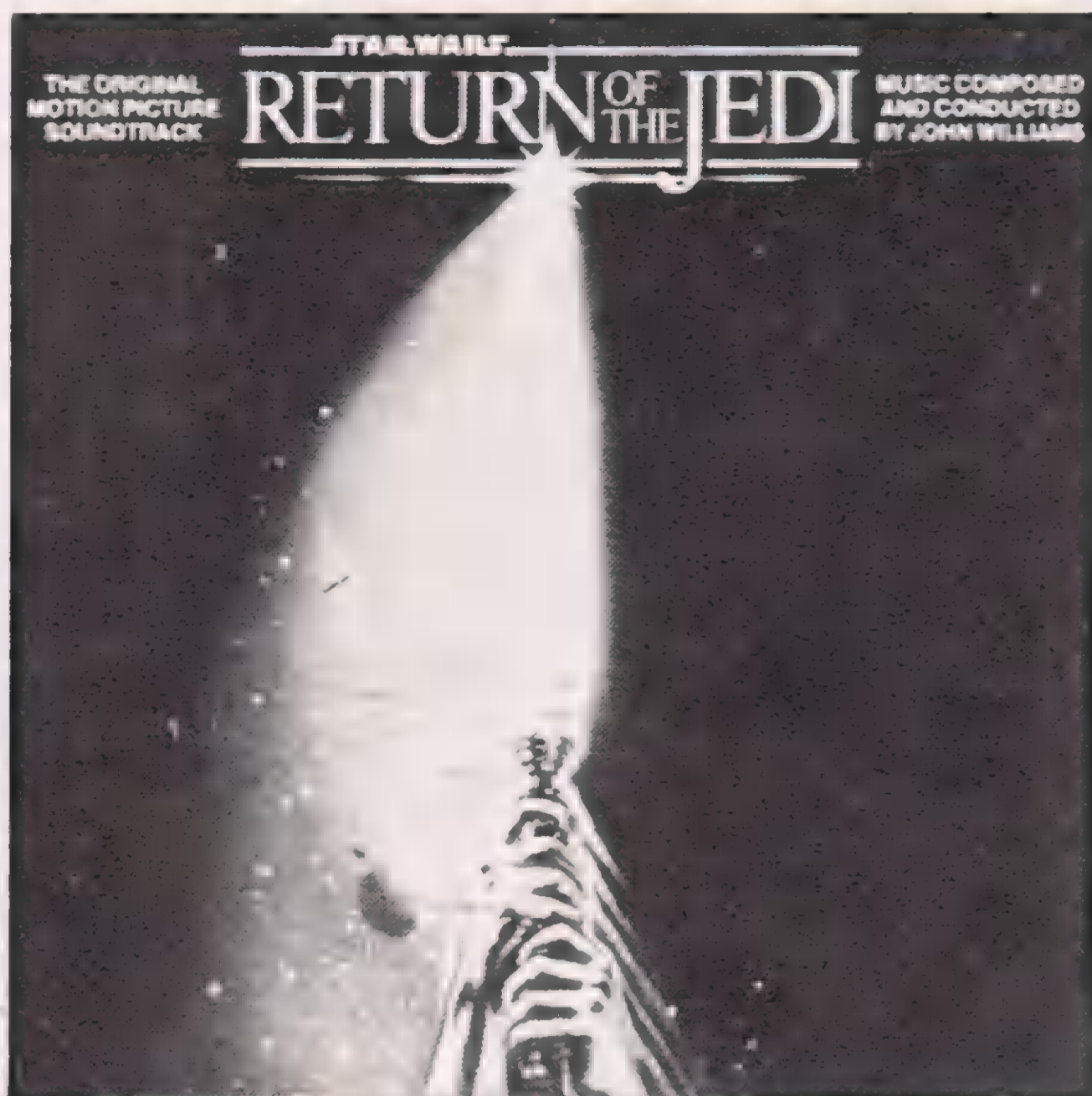
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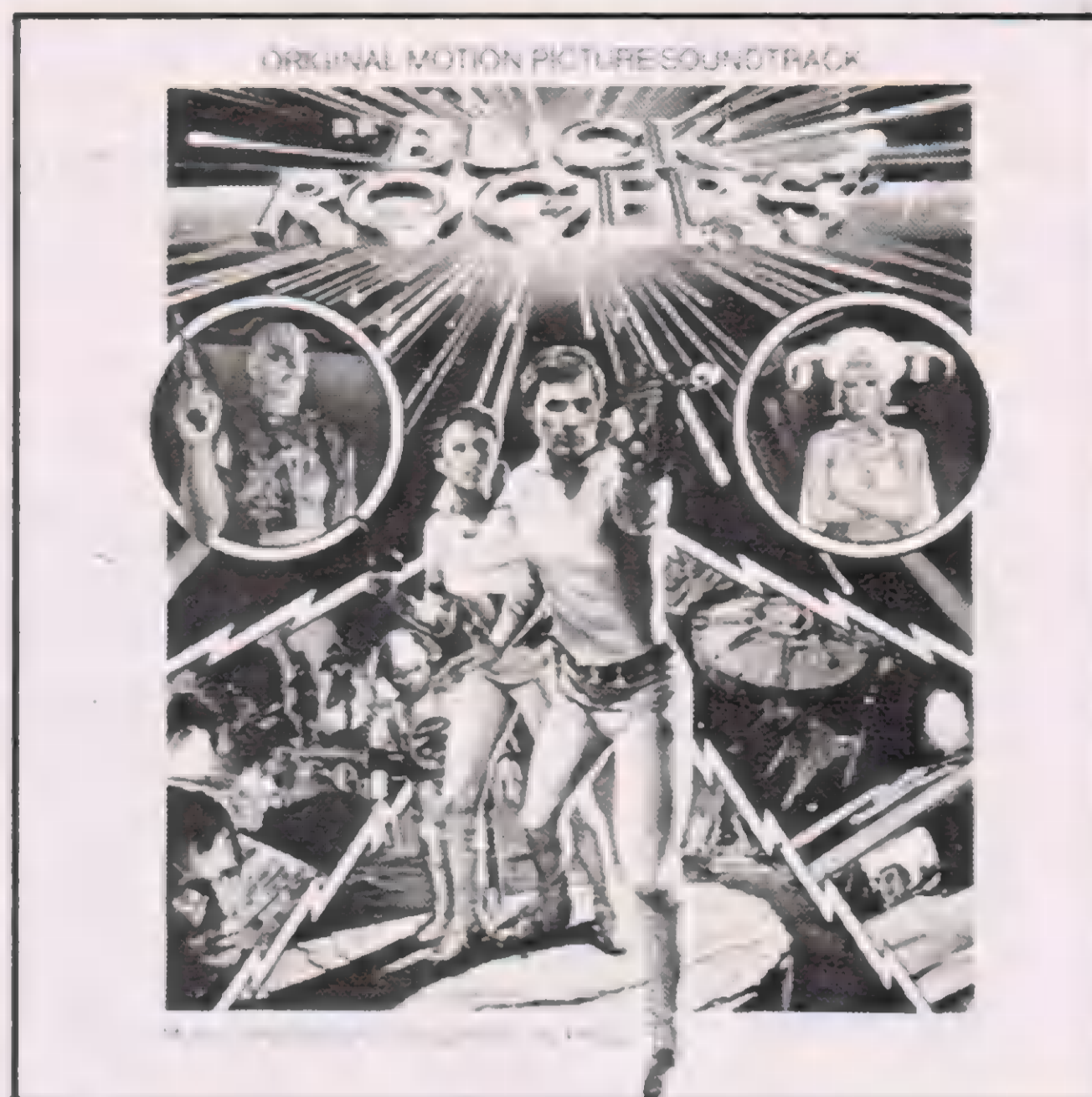
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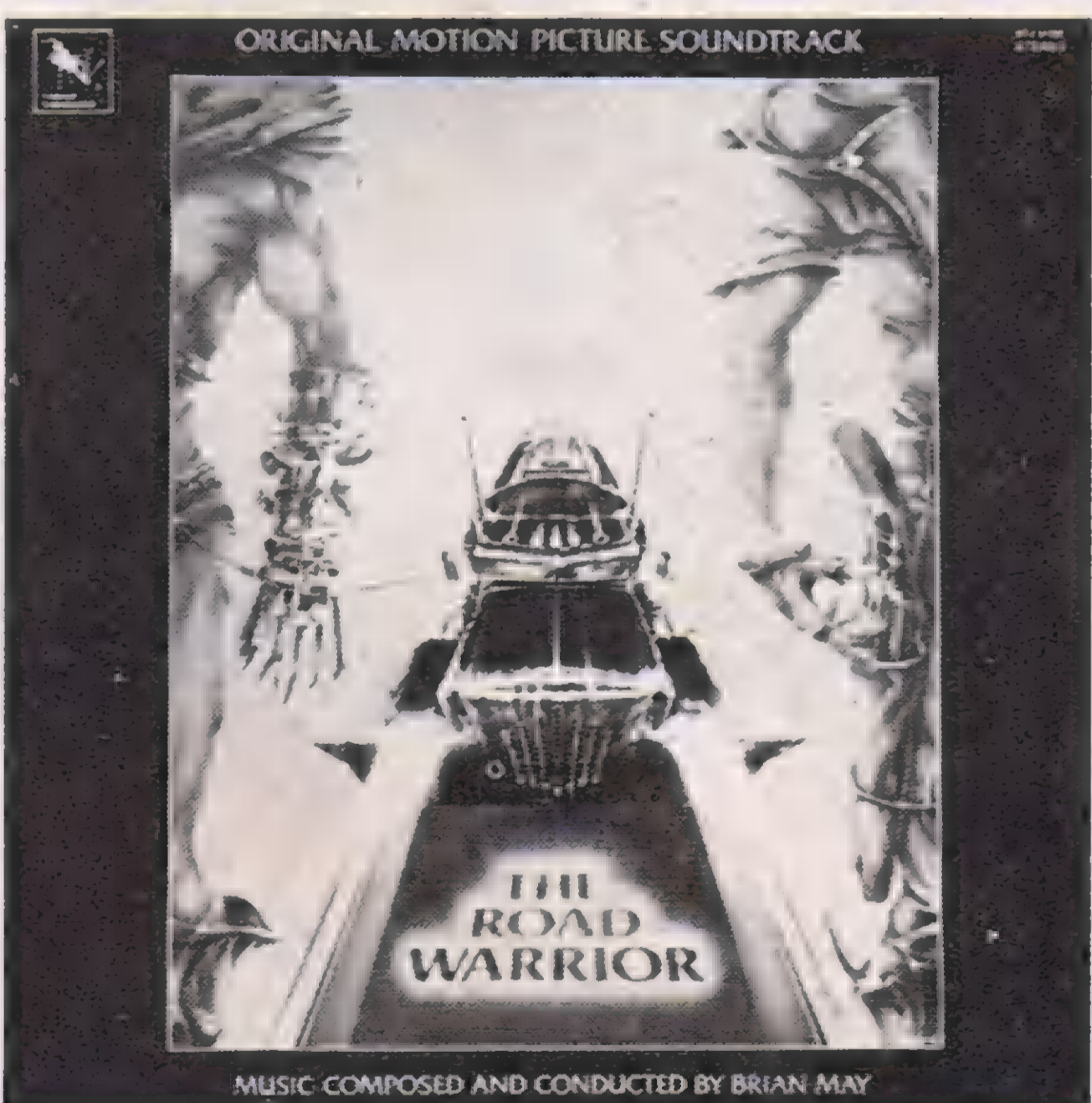
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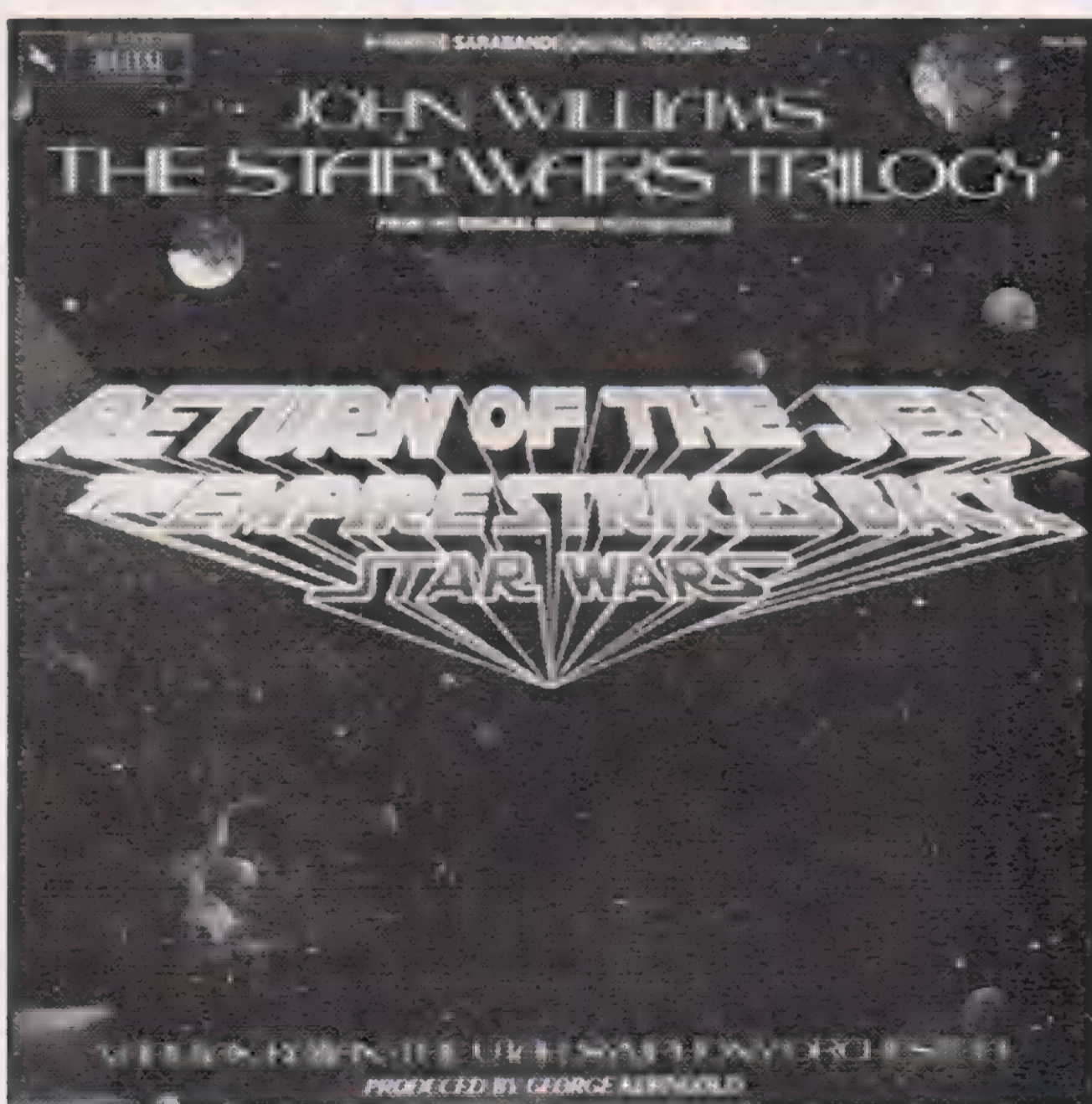
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John Barry's soundtrack score in a digital recording.

Dynamation

(continued from page 27)

but it requires a bit of mechanization. Since Dynamation is basically a torturous rotoscope process, why not bring the framed matte glass right up to the process screen, tape a sheet of tracing paper behind the glass, alter the focus on the projector ever so slightly so that the process image on the tracing paper is in focus, trace the matte line on the glass with a fine brush and black paint, and move the split glass back to its original position? Sounds easy enough. But there are certain factors to consider.

For one thing, the matte glass is one-half or one-third the size of the projection. Therefore the process image has to be *reduced* to conform to the size of the glass. To do this, the glass would have to be brought *behind* the process screen

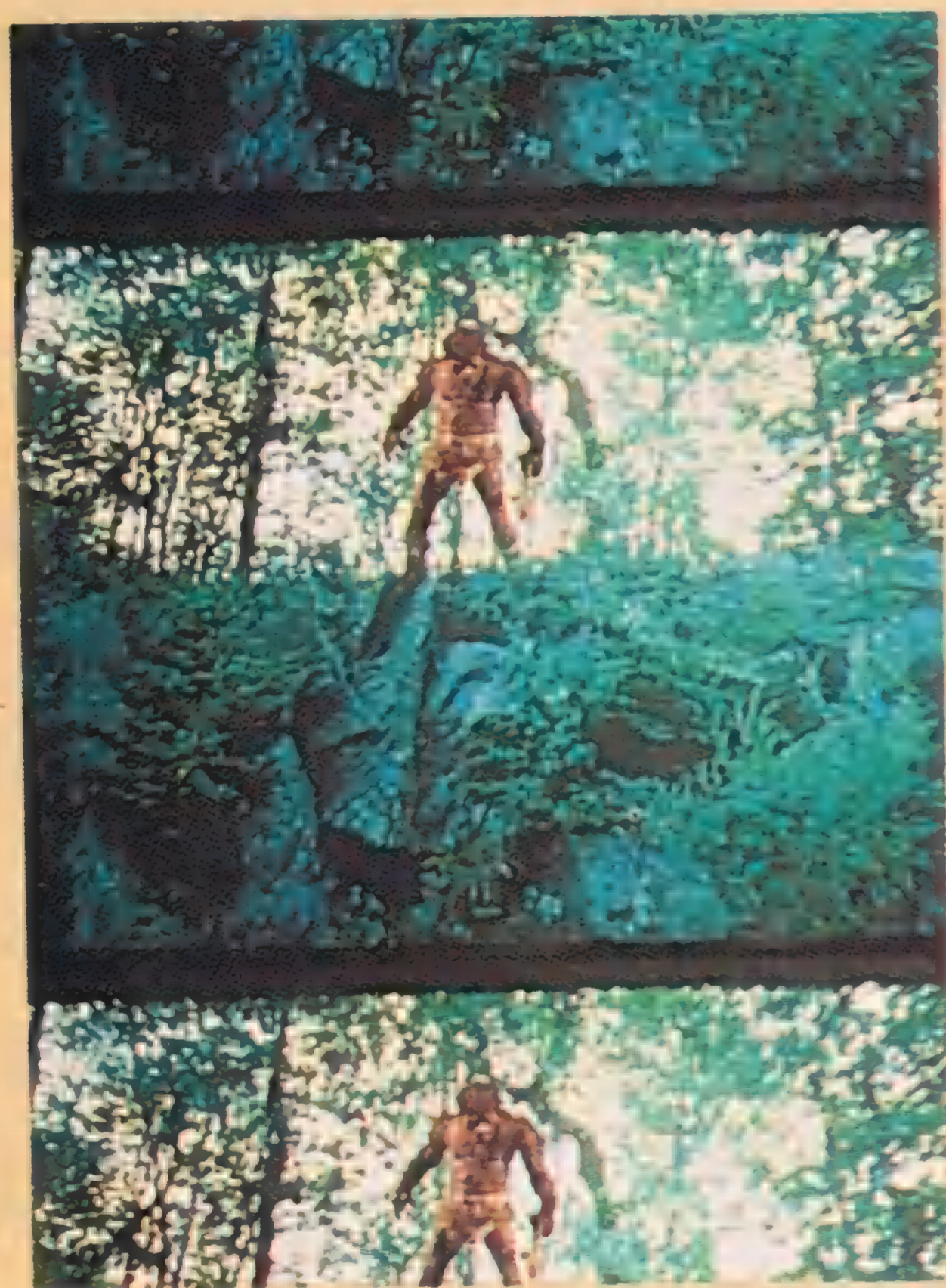
towards the projector bulb and imaged to the right size. The legs of the frame, of course, would have to be spotted with floor marks and brought back to its original position in front of the camera. But in looking through the camera again, it is unlikely that the matte would conform *precisely* to the projection due to minute degrees of optical displacement.

"That idea would work," Allen points out, "but only if an easel carrying the matte glass had *adjustment* capabilities. You would really need a way to fine-tune that easel so that it would correspond to the projection, now several feet away, with no margin for error. Your ingenuity in doing this is important, of course, but if you could adjust that easel, it would allow a lot of things to happen when your image is refocused from the small size to the large. You might discover that the projector has a certain backlash in the rack-and-pinion focusing. Or you might

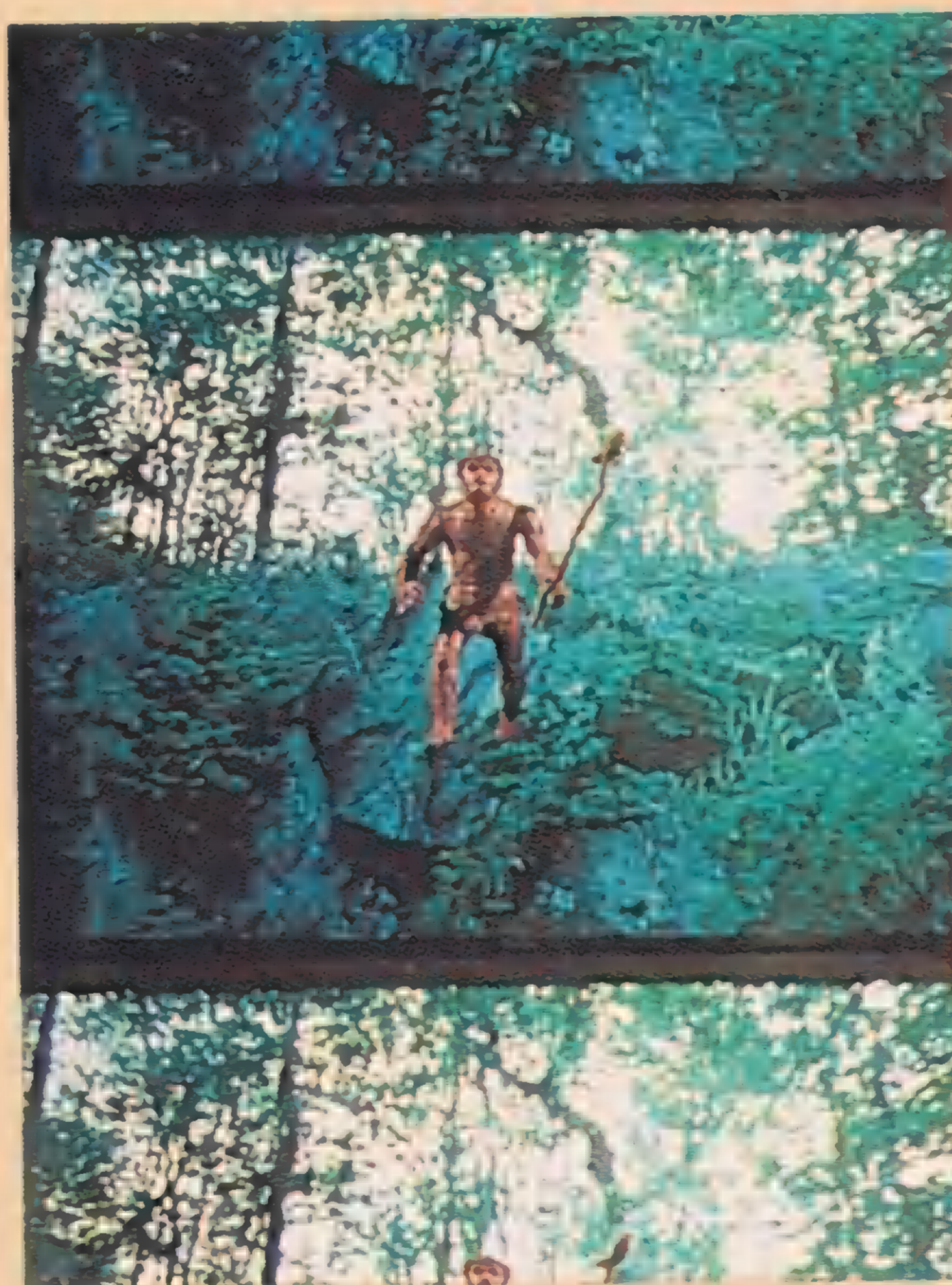
discover that the corners don't fit the same way. Therefore, you would need to be able to adjust your glass to very fine degrees, once it is repositioned in front of the camera. And for all of the mattes that Ray Harryhausen has been doing over the last 25 years, I would be very surprised if he hasn't been doing what I'm describing here. If he hasn't, he should have been."

Allen admits that there has to be a way to streamline this operation. "It's surprising," he says, "how often I've thought of that on *Rage Wars*. On *Caveman*, I didn't say 'Hey! We gotta mechanize this system!' Perhaps because there were so many of us and the situation lent itself more to the division of labor. But now, after *Rage Wars*, I know there has got to be an easier way. I am just waiting for the right picture to pay for it."

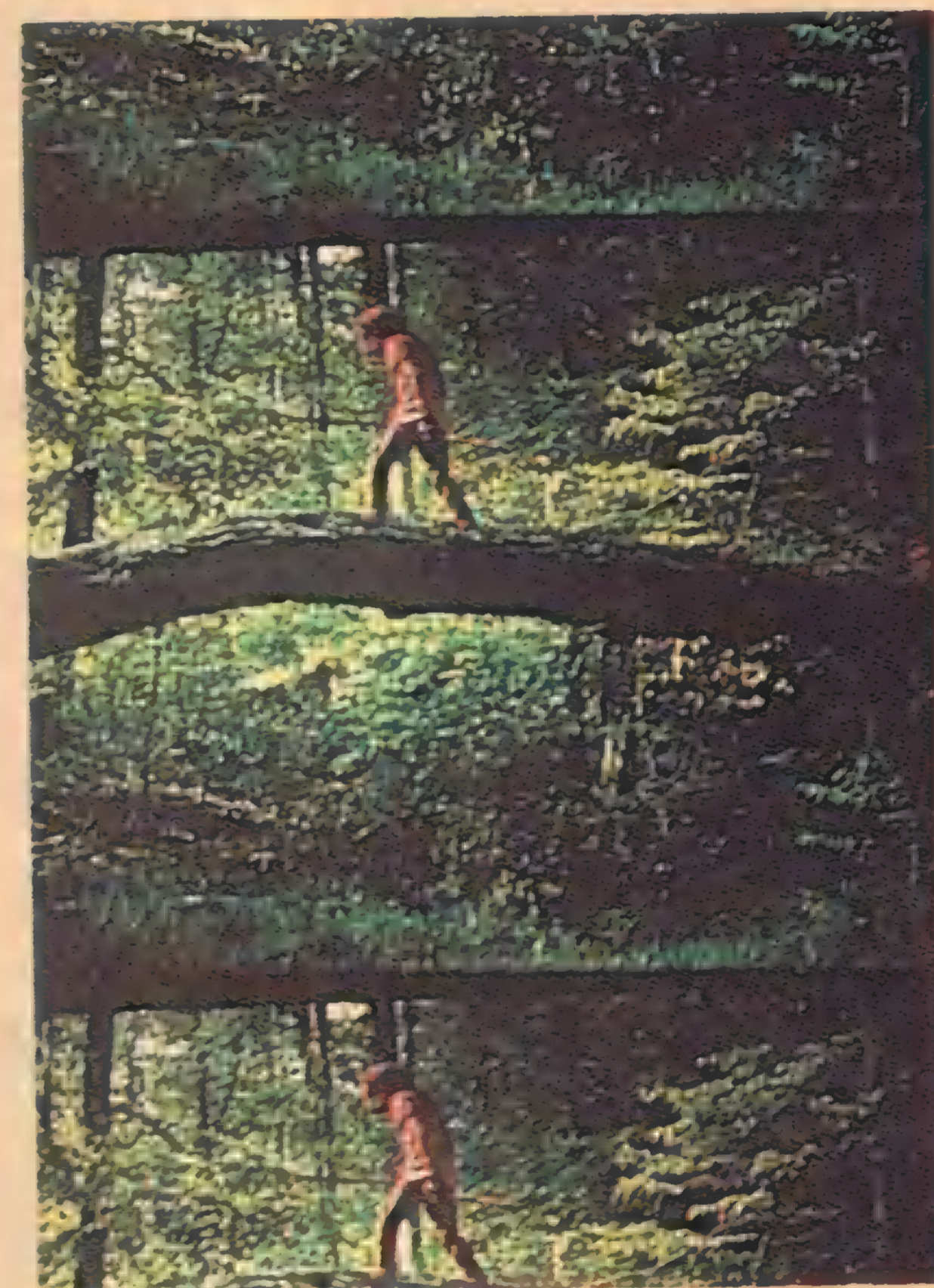
There's a bonus in all of this for the amateur working in 16mm. Most of these problems don't apply, for there are easier



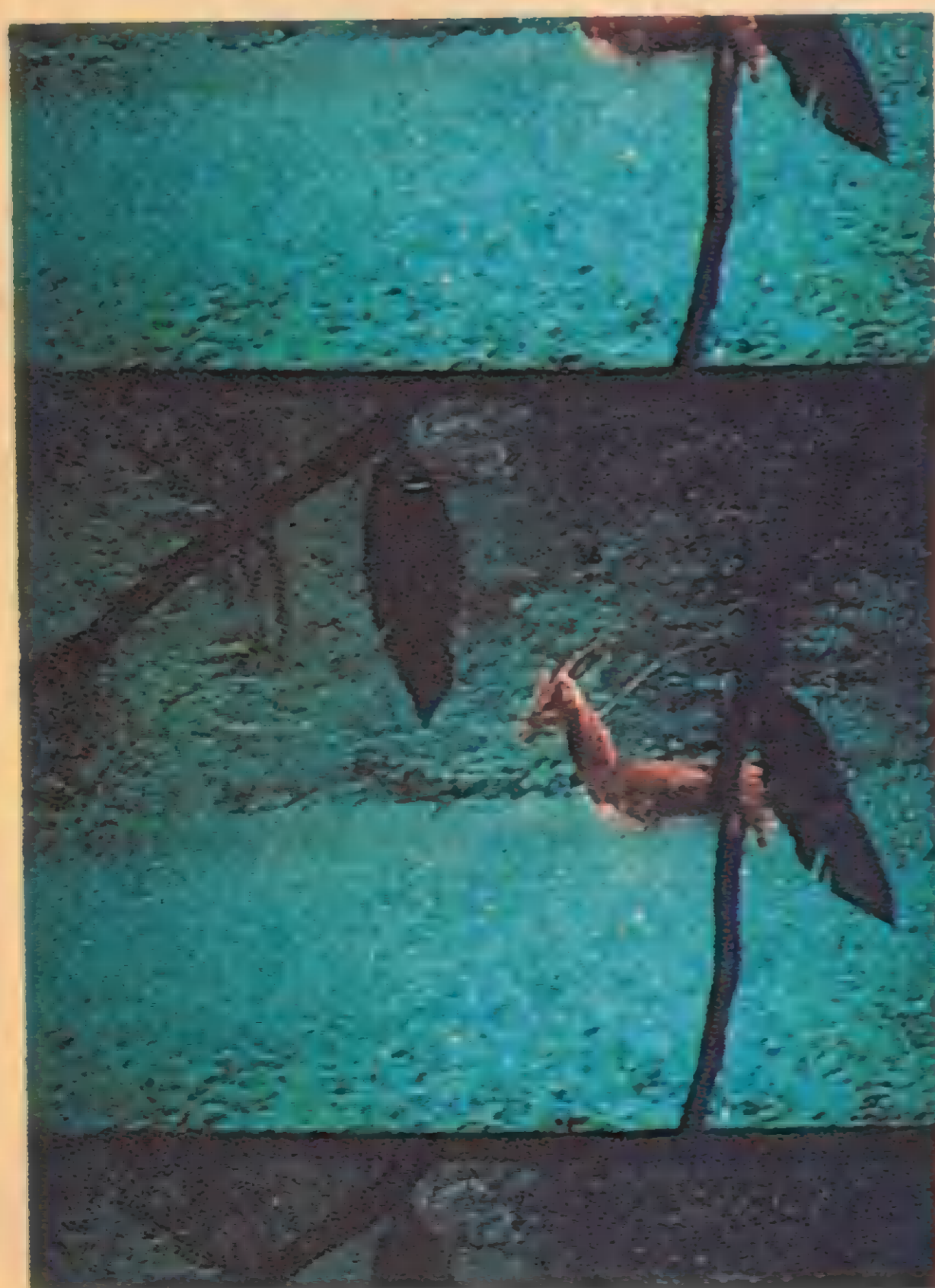
CLIP #1



CLIP #2



CLIP #3



CLIP #4

"The White Gazelle"

Clip #1: For *The White Gazelle*, animator Laudati split screened his miniature caveman onto a slide of a verdant hill, rather than building a miniature set. Matte glass was opaqued to conform to the ridge: the puppet is actually bolted to a plywood stage.

Clip #2: The puppet jumping-off-the-hill was animated in two passes, since it had to pass *through* the matte line. Increments in millimeters were necessary to calibrate the passes on the aerial brace.

Clip #3: A caveman "walks" across a projected log. This is 16mm Dynamation technique at its best.

Clip #4: For the gazelle grazing in a projected meadow, the matte was rendered in the matte box. Proximity to the camera lens results in a "mushy" matte line suitable for this shot. Actual tree branches were mounted in front of the camera during the split-screen work, to take one's eye off the matte line and to better marry the composite.



A Dynamation shot from *20 Million Miles to Earth* shows one of Ray Harryhausen's stop-motion creatures (the Ymir) combined with foreground live action.



The shaded portion of the photo is the live-action plate, showing where the matte lines were drawn to composite the live action with the stop-motion animation in this scene from *20 Million Miles to Earth*.

ways to resolve Dynamation mattes. It's still a trial and error game using a split-screen glass between the camera and the puppet stage. The traditional setup is mandatory for clean matte lines that don't "mush" together. However, when that degree of softness *is* desired, the matte box is superb. Since matte boxes are generally eight to ten inches away from the lens, one can place a small sheet of glass near the end of the bellows and grease-pencil in the desired shape while looking through the camera (depending, of course, how long your arm is, and how far out the box is extended). That section can then be masked with black tape cut

with an Exacto blade. For the counter-matte, the spray paint technique can be used. Even though 16mm's shorter lenses have a quicker tendency to resolve depth of field, it would not be enough to sharpen the matte line that much. So if the split has some haziness to it, it is generally OK to "spray and peel" and not worry about the light gap one must have in a 35mm format.

I've seen some fine work done in 16mm. In Anthony Laudati's film *The White Gazelle* (which recently won the national animation achievement award in the 11th annual Student film competition of the Academy of Motion Picture

Arts and Sciences) the animal was Dynamated onto a slide of a grassy field. (Using the matte box method, the split was rendered soft and its feet appeared to mush into the verdant ground. In another shot, a realistic-looking caveman walked across a log bridging a ravine. The log and the entire background was a slide projected onto Rosco process material and the opaque matte was rendered on a "split" glass conforming to the log's geometry. The split was clean and convincing; the log could almost be taken for a miniature.

The most daring shot in Laudati's film had the caveman walk up to the edge of high rock and jump off, falling below the frame line. Rather than build a miniature set piece, he found a slide that contained the rock with the desired perspective. In the shot, the figure actually jumps *through* the matte line before disappearing out of frame. The split at the rock's edge shifted a bit due to faulty camera registration, but the illusion was successful. In fact, it's impossible to perceive the split as it passes through his body. The real ingenuity of the shot is a matter of mechanics—the figure had to be animated in two repeatable passes, since it had to cross a matte line. To achieve this, Laudati rigged the caveman to a flying brace with monofilament and carefully marked off increments on the spindle control. Remarkably, the jump-through was repeated with no mismatch.

A final word on creating Dynamation shots. Always do a registration test with your camera *before* plunging into animation. Click off at least twenty-five feet of film on single frames (preferably of a wall grid), develop it and project it back onto the same wall grid to make sure no fluctuations exist.

If you are using background slides, bear in mind that colors shift in the rephotography. If you are trying to match a critical piece of miniature ground with colors in the background, do color balance tests. Ray Harryhausen does it. You should, too. And if you are single-framing a motion picture background, run off *another* registration test to ensure that stability of your process image. Chances are, if you're not using one of the expensive analyst-type projectors, there will be some fluctuation here and there. (The Athena Mark IV is an excellent analyst projector with good registration capabilities, with no decrease in illumination. The Bell & Howell 2592 also performs well and has a clutch mechanism to pulse frames, although light output is decreased by 50% on single frames.)

Dynamation is a wonderful technique, an open door to your imagination. But it is a trick, and the success of that trick ultimately depends on the quality of your animation. On that note, Doug Borton's *Model Behavior* in CINEMAGIC #24 is probably the most important article one could ever find in this magazine. *CM*

Raygun

(continued from page 47)

tually no difference between the two. Of course the \$75 piece of glass had nice qualities to it and if you can afford it that's great, but a regular piece of glass will work and you should try using it just to learn the technique."

"We used an off-the-shelf G.I. Joe toy tank in the film," Michael Sullivan interjects. "What was great about the tank is that we could use it for both live-action and stop-motion sequences because it's battery operated. You can steer it by aiming the turret. I animated a little recoil to the cannon as it was fired, using the beam-splitter technique to create the cannon firings. Because of the animated recoil, we had to reposition the explosion art for each frame. We also showed the tank rolling down a miniature street set surrounded by live-action miniature explosions—so there's a whole variety of techniques used to create one scene."

One very creative use of Wallach's animation stand in *Raygun's Nightmare* was in animating certain explosions. There's one shot where a tank is hit by a deathray and it explodes and turns into a little Datsun that goes speeding away. The animated explosion covers the tank for the frames necessary to replace it with the car. There's a similar shot in which the statue of Lincoln at the Lincoln Memorial is hit by a deathray from the Japanese Import Monster's eyes. When the flash of the explosion fades Lincoln is sitting on a Yamaha motorcycle and he speeds off through the streets of D.C. The numerous sight gags of the deathray turning symbolically American objects into very recognizable Japanese import items is hilarious and helps provide a theme to all of the visually stunning mayhem and destruction. Wallach also added cel animation—such as birds and stars circling Reagan's head after he gets punched by the monster—to a few stop-motion shots.

"The shot of the tank rolling down the street was particularly difficult to setup because we had to use forced perspective to create the illusion of great depth," Wallach reveals. "We made up five fire hydrants in different scales and we did the same thing with mail boxes, cars and all other repeating objects in the street. Another technique we used to force the perspective was to converge the rows of force perspective scaled buildings. Straight lines naturally converge, like the classic example of railroad tracks. In an actual distance of only a few feet on the miniature set, we forced the perspective to look like about a half-mile of city blocks. I also shot the scene in live action and hand-held the shot to create a fake crane shot, starting on the background and tilting down toward the foreground to change the perspective and bring

some camera movement into the scene.

Moving Right Along

"I think that there's nothing more effective in animation than a moving camera," Wallach continues. "That's something that Jimmy Picker taught me. When the camera moves you change perspective and the animation starts to have a life of its own."

"My only major criticism of Ray Harryhausen's work is that he never really got into moving cameras. The camera was always locked down because of the rear-projection setups that Ray used and you never really got a sense of the monster's point of view. I think that's why *Star Wars* took off and became the success that it was: because the camera is always moving and heightening the pace of the action. There's so much that can be done with moving cameras—especially with motion-control rigs—but you don't need computer-controlled rigs to do animated camera moves."

"The thing that makes Ray Harryhausen great is that he makes his characters come to life. No matter what you think about the static camera angles, the characters are really performing and they actually seem to come alive—The Cyclop *lives* in every kid's dreams and nightmares. In *Star Wars*, the camera pulls you through the scene, but the characters don't seem as alive as they do with Harryhausen's stop-motion animation because *Star Wars* is a much more mechanically-oriented film. Although I think that the stop-motion animation in the *Star Wars* films is well done, I also feel that the type of animation attempted—such as the Tauntauns in *The Empire Strikes Back*—is not nearly as difficult as what Ray Harryhausen has done. Although motion-control systems will give you X, Y, and Z movements and the computer will remember them exactly for you, if you forget to move the character a

frame, a pull focus a frame, move the camera a frame or make any of the minute movements for each frame, you've screwed up. Harryhausen has a computer in his head that keeps track of all of those details—and that's why he's the best. Don't think that just because other people are using computers you have to use them. They're just a tool. The end is more important than the means: use whatever gets you there."

"I used the compound table from my animation stand to animate the rack-focused camera moves in the film. Right now I'm having a rail made for animated camera moves. It will be different from most rack-and-pinion rails because it will be able to support about 800 pounds and it can be disengaged to move in live-action time. It's very important to be able to move a rail at live action time so you can see what you'll get. One of the main reasons that you want to be able to disengage a rail and move it back and forth is that in certain lighting situations you'll get a reflection that you didn't plan on and you'll know to bring in a flag at a certain frame to knock out that reflection."

"Too many animators knock themselves out trying to be as slick as Ray Harryhausen. Because *Raygun's Nightmare* was a parody film we were able to get away with a few minor technical flaws—which really helped keep the budget in line. After all, the film is a parody of Japanese science fiction B-movies, which are famous for their major technical flaws. Parody is supposed to look a little "off." The Import Monster looks like a person in a suit, but that's the way we intended it to look—it's all part of the gag."

"Of course I usually try to make my animation as smooth and slick as possible," Wallach explains, "I shoot to cut now, so I animate each scene a little longer than it will appear in the film. This



The stop-motion model of Lincoln sits with its armature. In the film, Lincoln hops on a motorcycle after being hit with a death ray.



The "pantograph" system for blowing up Reagan's head from the stop-motion model used a very precise system of reference dots.

gives me some leeway in getting the smoothest possible cut when I'm editing, I used to try to edit in the camera by shooting the animation in continuity, but after years of doing this I've learned to shoot to cut, I also try to shoot two takes of each scene if I have the time because you can usually do the animation a little better on the second take after running through it on the first take. If there are any minor problems on the first take you can correct them on the second. Even if the two takes are virtually the same, there's always a slight difference between two pieces of film and one will always work slightly better than the other."

Blowing it to Kingdom Come

The miniature explosions in *Raygun's Nightmare* are truly spectacular. "The miniature explosions were 'loaded' flashbulbs," Michael Sullivan illuminates. "The flashbulbs are surrounded with flash powder and wrapped in aluminum foil. What really gives off the brilliant glow is the aluminum foil 'shrapnel.' Of course they're practically silent—they just make a little 'poof' sound when they are ignited—so you have add sound effects in the mix."

"Everyone on the set wore goggles during the filming of all of the miniature explosion shots," Wallach explains. "We were very safety conscious—you're asking for trouble if you're not careful. When I was a kid my father was making spaghetti westerns (Wallach is the son of venerable stage and screen actors Eli Wallach and Anne Jackson) and I was allowed on the set. They'd have all sorts of bullet effects going off and when they fired the squibs pieces of wood and plaster would go flying all over the place. It was great fun but I also thought it was a little crazy—someone could have lost an eye—so I've always been very safety conscious in my own filmmaking as a result of that experience."

The single most impressive effect in *Raygun's Nightmare* is a shot in which the Godzilla Import Monster smashes the dome of the capitol building and it explodes violently—sending sparks and debris flying in all directions. "Making the Capitol building took a month all by itself," Sullivan reveals. I made the facade molds for the other buildings before I left for a trip to Utah and Peter and his crew made the facades while I was away. When I came back I got a set of plans for the Capitol building and went to work making the miniature. Most of the Capitol is made out of foamcore—except for the three-dimensional detailing which was molded in plaster—and of course the breakaway dome was also molded in plaster. The plaster columns were taken from a latex mold that we made of a plastic wedding cake column we bought at a bakery.

"We made three castings of the dome so we'd be prepared to shoot three takes," Sullivan continues. "We wound

up shooting only one take because the first take was perfect. One of the other two domes had broken in the truck on the way over to the studio and I kept the third dome so I now have a 13-foot-wide miniature of the Capitol building in the front window of my living room—which neighborhood vandals have been trying to break by throwing beer bottles at my window."

Getting a Big Head

The stop-motion Reagan's head bears a remarkable resemblance to the man himself and to the prosthetic appliance worn by the live actor. The actor really looks and moves like Reagan.

"A very talented sculptor named Dana Green sculpted the stop-motion Reagan head," Wallach continues. "The head was sculpted in Sculpey and the eyebrows, mouth, cheeks and chin were dug out and replaced with a matching-color clay, so we could animate it. Sculpey isn't pliable enough for lip-sync animation—especially after we baked it so it was rock hard. We then used a pantograph system—a system of reference dots—to scale-up an exact copy of the stop-motion head to make the sculpture that we used to mold the prosthetic appliances for the live actor who played Reagan. The actor who played Reagan, Don Williams, has all of Reagan's body movements and his voice down pat. He does a stage show of Reagan impersonations but he's only thirty years old and doesn't really physically resemble Reagan. Although his voice was perfect, we wound up using someone else's voice because of problems with the producer.

"When we scaled up the full-size head the detail didn't hold up very well so Mike Tobacco added the detail to the full-size head that we made the appliances from. The jowls, cheek bones eyebrows, chin and 'the turkey neck' were appliances, the nose and mouth and hair were the actor's. We had to make a complete set of appliances for each of the three days of live-action shooting because the appliances would start to degenerate under the hot lights as soon as we started shooting. So we'd start each day of live action with closeups and by the end of the day we'd be shooting long shots so the degeneration of the makeup wouldn't be noticeable. We're very pleased with the way it looks on the screen.

"*Raygun's Nightmare* took about six months to make and cost between \$25,000 and \$30,000—which sounds like a great deal of money to someone just starting out making films on their allowance money—but it's not really much for a six-minute, 16mm film that's completely loaded with animation and special effects. I make my living doing commercials and the price of animation for a one-minute commercial is generally much higher than our entire budget for *Raygun's Nightmare*, but I'd rather satisfy my creative urges by making a film like

Raygun's Nightmare—and make less money doing it—than to pump out less interesting commercial work just for the bucks.

"One of the reasons that the film took six months to make was that there were so many props and miniatures that had to be made before we could begin shooting," Wallach explains. "The animation took about one-and-a-half months and the live action was shot in three days—the rest of the time was spent in preproduction making props and miniatures and in post production editing and doing sound mixes."

"*Raygun's Nightmare* was produced for Atlantic Television and has been shown on various cable stations around the country. We've also entered it many film festivals and plan to keep it on the festival circuit as long as possible. We're very happy with the way the finished film looks and we're very pleased with the reactions of people who have seen it. It was a blast to make and it makes a great addition to my demo reel. This is the kind of filmmaking I enjoy most and I have a few projects of my own and a few collaborations with Michael Sullivan that I'd like to produce. Incidentally, I'm available for animating television commercials."

Raygun's Nightmare is a truly fun film. We hope that CINEMAGIC readers get a chance to see it at some local film festival or on some local cable station so you can see what we're so excited about. **CM**

Raygun's Nightmare Credits

Directed by Peter Wallach
 Produced by David Jablin
 Written by Lee Biondi and David Jablin
 Edited by Nick Smith
 Sound Editor Richard King
 Music by Rocco Notte, Richard Bush
 Art Director Michael Sullivan
 Production Manager Michael Faerman
 Master Costume Designer . . . Valerie McNeil
 Assistant to Valerie John Flowers
 Makeup Artist and Props . . . Michael Tobacco
 Oval Office Set Dresser Lucinda Bush
 Sculptor Dana Greene
 Production Assistants Gregg Guinta,
 Caroline Doohan
 Re-recording Mixer Mel Zeinicker

Cast

The President Don Williams
 The Import Monster Valerie McNeil,
 Roberta Molton, Caroline Doohan
 Pilot Michael Faerman
 Newscaster Steve Molton
 Soldiers . . . Peter Wallach, Michael Sullivan,
 Michael Tobacco, Caroline Doohan,
 Judy Huczko

Special Thanks to . . . Thundergrey Studios,
 Movie Lab, General Camera, Sound One
 Studios

Produced for Imagination Productions in
 association with Peter Wallach Enterprises.

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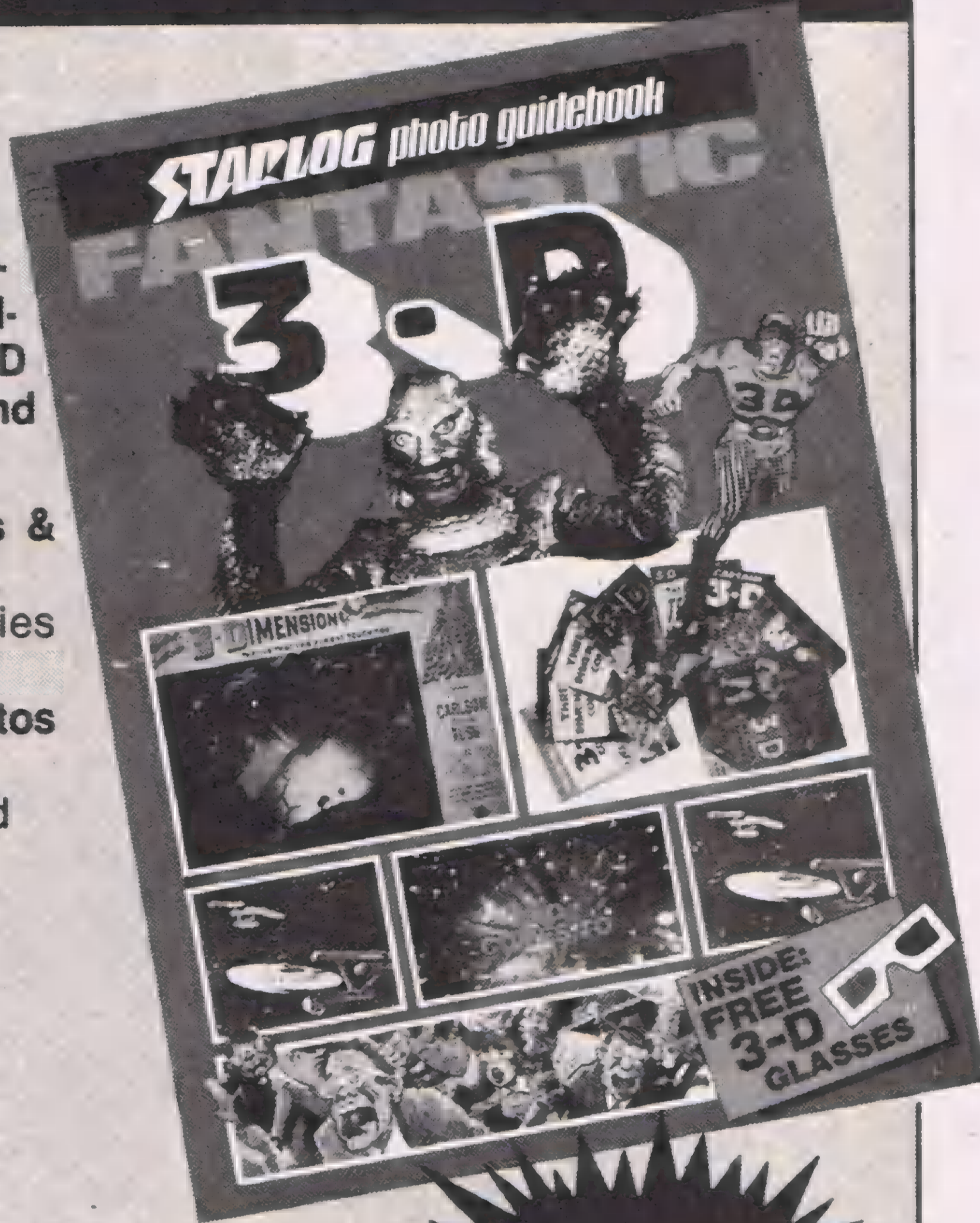
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Danforth

(continued from page 23)

become a dull 'zomboid.' If you *don't* turn yourself off but say nothing then you're churning out ulcer-acid your whole life. You've got to be interested, you've got to be keen and you've got to believe that what you see is right. The hardest thing for me to realize was that if you want to be *politically* successful in this business you've got to learn not to perceive what your senses tell you is in front of you. To me that is a terrifying concept.

Backstabbing

"I think there are probably a number of other professions which have the same kind of jealousy and backstabbing that permeates the effects field", says Danforth, "I think there is something about the personality of a person who attempts to get into effects which makes him sort of paranoid. A person who I know in the business, J. Macmillian Johnson, who was primarily an art director, but had also worked in special effects, once said to me, 'What is it, Jim, with these guys that are in effects? You know when one art director hears about another art director who's out of work and, if he knows that there's a job, he'll call and tell him about it. When *you* guys hear there's a job you keep it a big secret and hope nobody else finds out!' Apparently among art directors there's a lot more exchange and helpfulness and sharing. I sure don't find it in visual effects".

Union Hassles

Jim Danforth is not a member of any union. "Once I counted up how many unions I would have to belong to do stop-motion work according to union rules," says Danforth "It came out to 13 or 15. But one person is only supposed to do one job—you're only allowed to work within the jurisdiction of one union in one day which means that no one person can legally do stop-motion work the way it is normally done."

Danforth thinks that stop-motion is best done when one person is in charge of a particular shot. He says, "It usually only takes one person to do an animation scene. But the unions would have 13 people sitting around watching one person work. It's ridiculous. I think that's why there haven't been that many stop-motion pictures done in this country. *The Lost World, King Kong, and Mighty Joe Young* are really the only stop-motion films done in major studios and I know that there were considerable feelings of restriction on *Joe Young* because of the union situation.

"Companies like Projects Unlimited had union contracts, but never worked in accordance with the union. I was in the propmaker's union for 10 years. I never once had a job where I was not required to place myself in a position of jeopardy with my own union in order to obtain employ-

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ment. I was always required to work outside the jurisdiction of my local union. The regulations were *regularly* broken. I don't say this in criticism of my employers. The unions are totally misinformed as to how this work is done. At least, that's the nice explanation. There's another scenario that says that unions are not here to help anyone make movies, but simply to feather their own nests.

"According to union restrictions, the person that moves the model can't push the button on the camera. If the model needs to be retouched in the middle of a scene the animator is *not* supposed to pick up a brush and repaint the model. The animator can't run a process projector (and if you've got two process projectors on a stage, you must have *two* process projectionists). You have to have a grip and you have to have an electrician. You should have a driver. If you have to go buy something, a union driver had to take you. In a big studio, you can't *buy* anything. You must have a man who's a *buyer*!

"The best way to reform the unions is to adhere *religiously* to the unions own regulations. Then they would be forced to make changes because film production would grind to a halt. But people break the rules and say, 'Well, I got away with it. Let's not tell anybody.' So we have money being laundered and people doing four and five jobs pretending they don't. It's a very bad situation.

"The unions are now a bigger problem than the producers who the unions came into being to protect us from. The unions are *not* my friend. They are not the workers friend. The unions are the *enemy* of the workers in the film business who would be doing a lot better without them. There would be more films being made if it weren't for the unions; *they* are the problem."

Technology Fever

It's 1984 and technology fever has arrived. Just as there are fads in clothing, food and pop music, there are brief flings of affection with special effects processes. Jim Danforth doesn't hop onto every technological bandwagon. He explains that "rather than use a lot of technologies, I like to focus on a *few* things and get them right. I've been using basically the same procedure to do animation composites as I have for matte paintings, even though there are other ways to do it.

"But to certain types of minds," he continues, "you can't sell talent, you can only sell technology. When you get a buzz word like Go-Motion, you've got to fight it. A good example is what happened with the front projection process. Some misguided individuals spread the word in Hollywood some years back that front projection was going to solve *all* the filmmaking problems. Now, we wouldn't have to go on location anymore. It could



Jim Danforth at Bray Studios, England (1969) watches Roger Dicken sculpt the pleisiosaur for *When Dinosaurs Ruled the Earth*.

PHOTOS: 1984 JIM DANFORTH

all be done in the studio. It's baloney! As people discovered, front projection is just one more tool to be used when applicable.

"It's a peer pressure situation. If you don't have Go-Motion, if you don't have effects by ILM, if you don't have front-projection, if you don't have motion-control, then you're not doing it 'right.'"

Is stop-motion animation a sufficiently realistic technique for the 1980's with the continuing trend towards believability in special effects or will the high-tech computer-controlled Go-Motion process displace it as color film displaced black and white, as foam-rubber displaced nose putty? Jim Danforth doesn't think so.


"I think that Go-Motion has been a *very* bad occurrence for the animation business. People—producers mostly—are looking at what is a special case situation and trying to apply it universally. The problem inherent in Go-Motion that restricts its wider use is that the pushing rods that control the movement of the model must be hidden, normally through the use of traveling mattes" [with the external matte line problems that frequently mar their effectiveness]. "Go-Motion does not work in full miniature sets," says Danforth.

"With stop-motion I don't have to say, 'Oh, God, I can't have it turn around in this shot because to do that I've got to stop, I've got to register, I've got to reprogram, I've got to rotoscope it all, *just to make it turn around!* What is good about the stop-motion process is that it *does what you want it to do*. It's not limiting.

"What we have," he continues, "is one picture, *The Empire Strikes Back* in which the Tauntaun sequence appeared. Since it was set in the snow they could hide the control mechanism behind white cards. Then we had the *Dragonslayer* cave sequence, but again it's a special case because the dragon is in the dark and you can hide the control mechanism in the dark." What could not be hidden required the use of mattes to obscure the control rods connecting the dragon to the computer-operated motors that governed its movements. "You cannot apply the Go-Motion technology that was

used to create those two special sequences to the types of pictures that have previously been done with stop-motion animation. When someone can show me something done in Go-Motion that looks like Ray Harryhausen's *Gwangi* with horses circling around him, with Gwangi lashing his tail wildly and running behind rocks and jumping over other dinosaurs and it *doesn't* have a big matte line all around it, then I am going to start to get interested. I don't see that happening. Even the folks at I.L.M. haven't used Go-Motion lately. They're using rod puppets!"

"No, stop-motion is not 'realistic;' yes, it *is* realistic enough for some people. You always have to ask, 'What are the alternatives?' That question has always been with us. It has been going on since 1932 when they were trying to figure out if Willis O'Brien's *Creation* was good enough to get made. I think we would all like to see the animation be a little better than it has been so far. But, if in the search for alternatives we divest ourselves of the advantages of the old techniques, then we are not going forwards, we are going backwards."

"If the film is good, no one is going to care if it is stop-motion or Go-Motion, live-action or animation. What *counts* is the effect of what is on the screen and if the audience is being entertained; if people are enjoying themselves, they won't care how you did it." 

COMING IN PART II:

Shop-talk dominates Part II of this series as Jim Danforth discusses the intricacies of stop-motion model construction. Further revealed, too, will be Danforth's lucid insights into his work and the profession of special effects filmmaking. Here's a sample:

"Stop-motion is really an anti-survival technique. Man is not meant to be in a dark room 15 hours a day, 6 days a week for a year at time, doing things which do nothing but create tension. It can be really bad. But working with people and telling stories, that has been one to the basic human functions since the earliest days of our history."

Supply Sources

By JOHN DODS

Here is a list for people who make things. Have you ever wondered where to buy cold-cure foam rubbers, armature parts, glass eyes, or hardware for cable-controlled makeups? If you have, this list is for you!

The emphasis here is on materials of special usefulness to model makers, makeup artists, and stop-motion filmmakers.

Most of the companies listed here have a catalog available for the asking; note that some now have 800 toll-free numbers.

Let us know if you can add to this list and of your own experiences in dealing with the companies.

This is your list. Tear it out, tack it to your workshop wall, and keep it where it will always be handy. Filmmaking is *hard!* Make it easier by using the right materials for the job at hand.

Special thanks to makeup artist Arnold Garguilo for his assistance in assembling this list.

Art and Sculpture Supplies

Art Supply Warehouse
29 Haviland St.
South Norwalk, CT 06854
(800) 243-5038

Art supplies, air brushes and very low prices on acrylic paints when ordered by the gallon (black and white Liquetex brand sells for \$29.60 per gallon).

Polyfoam Products Co.
9420 Byron St.
Schiller Park, IL 60176
(312) 678-4836

Sculpture Associates
40 East 19th St.
New York, NY 10003
(212) 777-2400
Clay and sculpture supplies.

Sculpture House
38 East 30th St.
New York, NY 10016
(212) 679-7474
Good quality clay, plaster, Hydrocal, Ultracal and sculpture supplies. Also sells *outrageously* over-priced liquid latex.

Artificial Eyes and Taxidermy Supplies

G. Schoepfer, Inc.
138 West 31st St.
New York, NY 10001

(212) 736-6939-6934
Sells everything from doll's eyes on up to human-sized artificial eyes. Prices high except when ordering in quantity (50 pairs or more). G. Schoepfer is a supplier to Jim Henson Associates (The Muppets).

Jonas Brothers, Inc.
Denver Taxidermy Supplies
1037 Broadway
Denver, CO 80223
(303) 777-3377
Taxidermy supplies and polyester resins.

Tech Optics
2903 Ocean Park Blvd.
Santa Monica, CA 90405
(213) 450-2453
Eyes.

Van Dyke's
Woonsocket, SD 57385
(800) 843-3320
Animal eyes and taxidermy supplies. Low prices.

Casting and Mold-Making Materials

Adhesive Products Corp.
1660 Boone Ave.
Bronx, NY 10460
(212) 542-4600
RTV rubber, Monzini casting plastic, liquid latex, polyester resins.

Aquaplast
WFR-Quaplast Corp.
P.O. Box 215
Ramsey, NJ 07446
(201) 445-2097
Low temperature plastic splinting materials. This material works like plaster bandages. You dip it in hot water and it hardens as it cools. This material has applications for reinforcing plaster molds and making body casts.

BJB Enterprises, Inc.
6350 Industry Way
Westminster, CA 92683
(213) 598-7777
(714) 894-0647
Manufacturers of Skin-Flex (reportedly the material used for the mermaid's tail in Touchstone Productions' *Splash*). A highly-elastic urethane plastic. Available in 1 quart kits for \$25 or 1 gallon kits \$60 of A, B, and C components. Also supply polyure-

thane foam, \$25 minimum for 1 quart.

IASCO
5724 West 36th St.
Minneapolis, MN 55416
(612) 920-7393
Large selection of hard and soft mold making materials and plastics. IASCO also sells vacu-form machines.

Knickerbocker Plaster Co.
588 Myrtle Ave.
Brooklyn, NY 11205
(212) 638-7355
Plaster, Hydrocal and Ultracal.

Permaflex
1919 East Livingston Ave.
Columbus, OH 43209
(614) 252-8034
Hard and soft mold-making materials.

Scotch-Flex
3-M Center
St. Paul, MN 55144
(800) 854-6986
Casting tape similar to that sold by Aquaplast.

Smooth-on, Inc.
1000 Valley Rd.
Gillette, NJ 07933
(201) 647-5800
Smooth-on (reportedly used by Dick Smith to make bladders for *Altered States* and by Rick Baker for the "chango heads" in *American Werewolf in London*), and many mold-making materials.

Teledyne Dental Supply Co.
1550 Green Leaf Ave.
Elk Grove Village, IL 60007
(312) 593-3334
Slow setting (about five minutes) alginate-like mold-making material for face and body casts.

General Supplies and Materials

Edmund Scientific
101 East Gloucester Pike
Barrington, NJ 08007
(800) 257-6173
Interesting, hard-to-find, offbeat items including motors, tools, magnets, front-surfaced mirrors, projectors, unique lighting equipment, photographic accessories and rear-projection material. Send for their catalog.

Hobby Lobby International
Rt. 3

Franklin Pike Circle
Brentwood, TN 37027
(615) 373-1444
Tubing and model airplane cable in quantity for push-pull applications. Low prices.

Jerryco, Inc.
601 Linden Place
Evanston, IL 60202
(312) 475-8440
Sundry and bizarre surplus parts and gadgets. Everything from bombs to vacuum pumps and bed pans. Low prices. The catalog is a browser's delight.

The Joint Works
P.O. Box 9280
Marina Del Rey, CA 90295
Bill Hedge's company manufactures "Clokey" joints for stop-motion armature fabrications. Reportedly good quality. Prices very reasonable (enough parts for a simple armature may run around \$300.00. This is *not* expensive). We experienced a *long* delay (two months) before receiving their very nice 24 page B & W catalog.

Sava Industries, Inc.
70 Riverdale Rd.
P.O. Box 30
Riverdale, NJ 07457
(201) 835-0882
Very fine cable (\$45.00 for 200 feet) for push-pull applications.

Small Parts, Inc.
6901 Northeast Third Ave.
P.O. Box 381736
Miami, FL 33138
(305) 751-0856
Flat metal stock, ball bearings, wide selection of hardware useful in stop-motion armature fabrication. Also fine steel cable and silicon tubing for cable-control applications. Send for their free catalog.

Superior Bulk Film Co., Inc.
442-450 North Wells Street
Chicago, IL 60610
(312) 644-4495
Photographic film and supplies generally unavailable in local camera stores. Carries specialized 8mm and 16mm film stocks. Write for catalog.

Techni-Tool
5 Apollo Rd.
Box 368
Plymouth Meeting, PA 19462
(215) 825-4990
Syringes, steel cable (for push-pull control applications), unusual tools and hardware.

Makeup, Foam Rubbers and Liquid Latex



John Dods sculpting yet another gross looking head.

Alcone Co.
Paramount Theatrical Supplies
5-49 49th Ave.
Long Island City, NY 11101
(212) 361-8373
Enormous selection of makeup supplies—many different brands. Paramount sells McLaughlin foam rubber (reportedly used by I.L.M.) for \$60.00 per gallon. They also sell an inexpensive foam rubber under the Paramount label by the quart.

Foamex Co., Inc.
1641 Border Ave.
Torrence, CA 90501
(213) 328-1332
Rigid and flexible foam products. Write or call for their sample package of 24 kinds of cured foams. Foamex sells mostly *cold* curing foams.

Friends Beauty Supply Co.
5202 Laurel Canyon
North Hollywood, CA 91607
(213) 769-3834
Charles Shram foam rubber sold under the name "Windsor Hills Foam Kit" for \$84.95 per gallon. Makeup supplies.

Lang Dental Manufacturing Co., Inc.
2300 West Wabansia Ave.
Chicago, IL 60610

(312) 486-5264
Jet Dental Acrylic, used for making realistic teeth.

R&D Latex Corp.
5901 Telegraph Rd.
Los Angeles, CA 90002
(213) 724-6161
Popular brand of moderately priced foam rubber and liquid latex.

Research Council of Makeup Artists
52 New Spalding St.
Lowell, MA 01851
(617) 459-9864
Makeup artist Vincent Kehoe's company has a very complete (but expensive) line of makeup supplies, including foam rubber.

R.T. Vanderbilt Co.
30 Winfield, St.
Norwalk, CT 06855
(203) 853-1400
Sells "Set-sit 104" latex accelerator (makes foam latex cure faster in oven) and pigments to color latex rubber.

Westwood Latex
Westwood Ceramic Supply
1440 East Lomitas Ave.
City of Industry, CA 91744
(213) 330-0631
Liquid latex and casting plasters. 

Easy EFFECTS

Other Worlds Made Easy!

A simple and effective technique for creating fantastic "outer space" shots.

By JACK IMES, JR.

Your script begins with a cosmic shot: a GIANT PLANET ROTATING AGAINST A BACKGROUND OF STARS. Okay, but how do you put it on film? In this article, I'll show you how to make realistic planets and moons by an easy *projection method*. The main advantage of this method is that you can easily control the way the "planet" looks on film. You can change the surface colors, as well as produce unusual shadow effects such as half, quarter and crescent planets. You will also be able to "rotate" the planet by taking advantage of a special optical illusion.

THE PLANET

Step 1: The planet or moon is made from a rubber ball about three inches in diameter. I suggest it be a light pink or aqua color rather than white to avoid later exposure problems. The ball's surface should be as smooth as possible, without chips, scuffs or other obvious defects.

Step 2: Push a three-penny nail into the ball to make a guide hole for the support stick. Remove the nail and insert the stick. I suggest the length of the stick be between 8 and 12 inches.

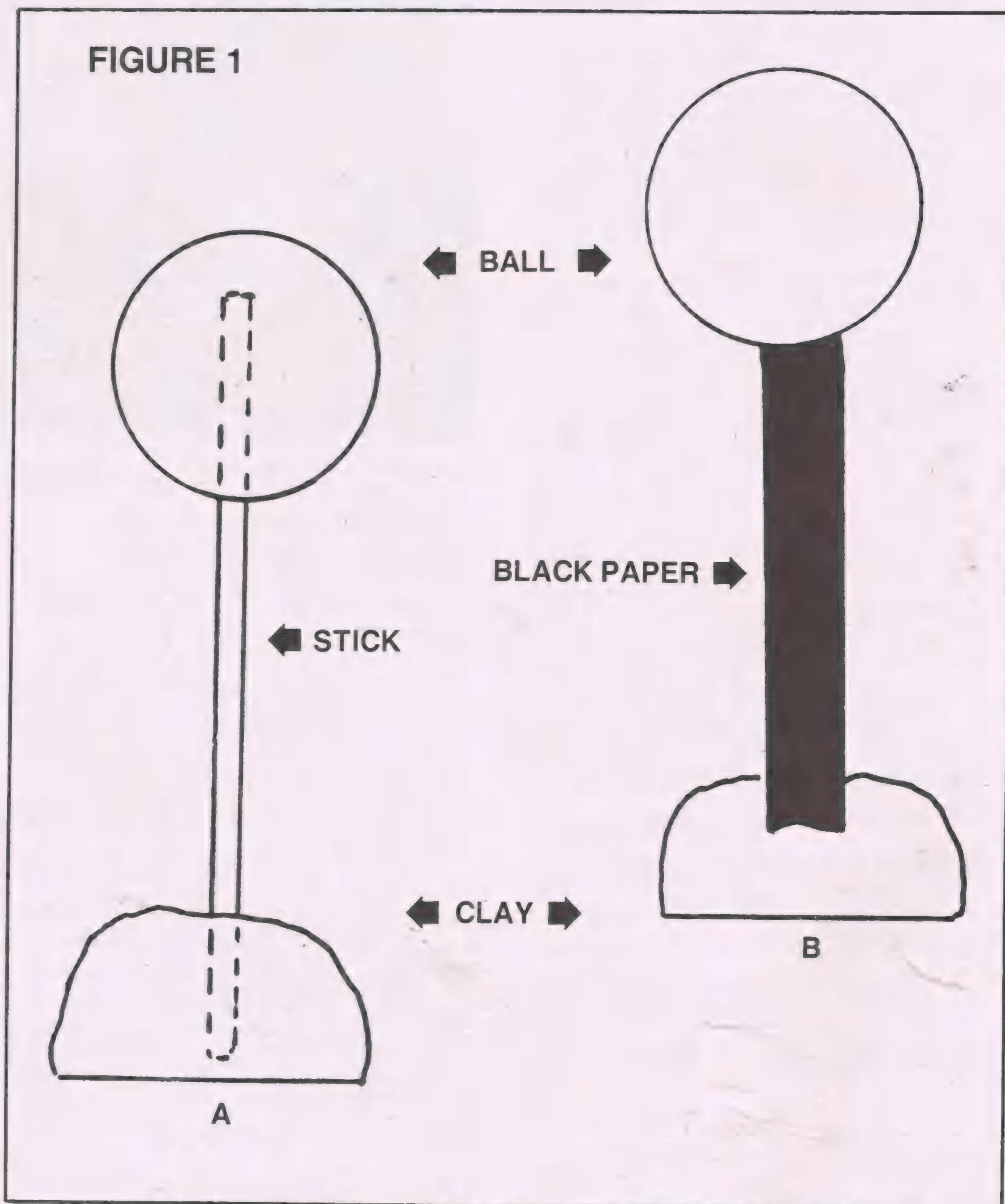
Step 3: Keep the stick upright by anchoring the free end in a fistful of clay or putty caulk (about 12 to 16 ounces). Figure 1A shows the basic support and ball.

Step 4: Mask the stick with a 1/2-inch by nine-inch piece of black art paper. Adhesive tape will hold the paper in place. This mask will be facing the camera at all times in the finished set-up. The top end of the mask should be flush against the edge of the ball as seen in figure 1B.

THE STAR BOX

Step 1: Open the bottom end of a large cardboard box (at least two-feet cubed). Cut several ventilation holes to avoid later overheating by the photoflood.

Step 2: Cut a sheet of black art paper and a sheet of white tracing paper (or



frosted mylar) the same size as the open mouth of the box.

Step 3: Use a needle to punch random pinholes in the black sheet (but not in the tracing sheet). The hundred or so pinholes will be the "stars" so don't make them too big by punching them with a thumbtack, pushpin or nail. A sewing needle or straight pin is right to scale for a three-inch ball "planet."

Step 4: Attach the two paper sheets to the box with four thumbtacks as seen in figure 2A. The white tracing paper faces into the box, the black sheet outside.

Step 5: Place a 300-watt photoflood and reflector into the backside of the box about two feet from the tracing paper. You can keep the reflector clear of the cardboard by propping it up on three small bricks, as seen in figure 2B.

FIGURE 2A

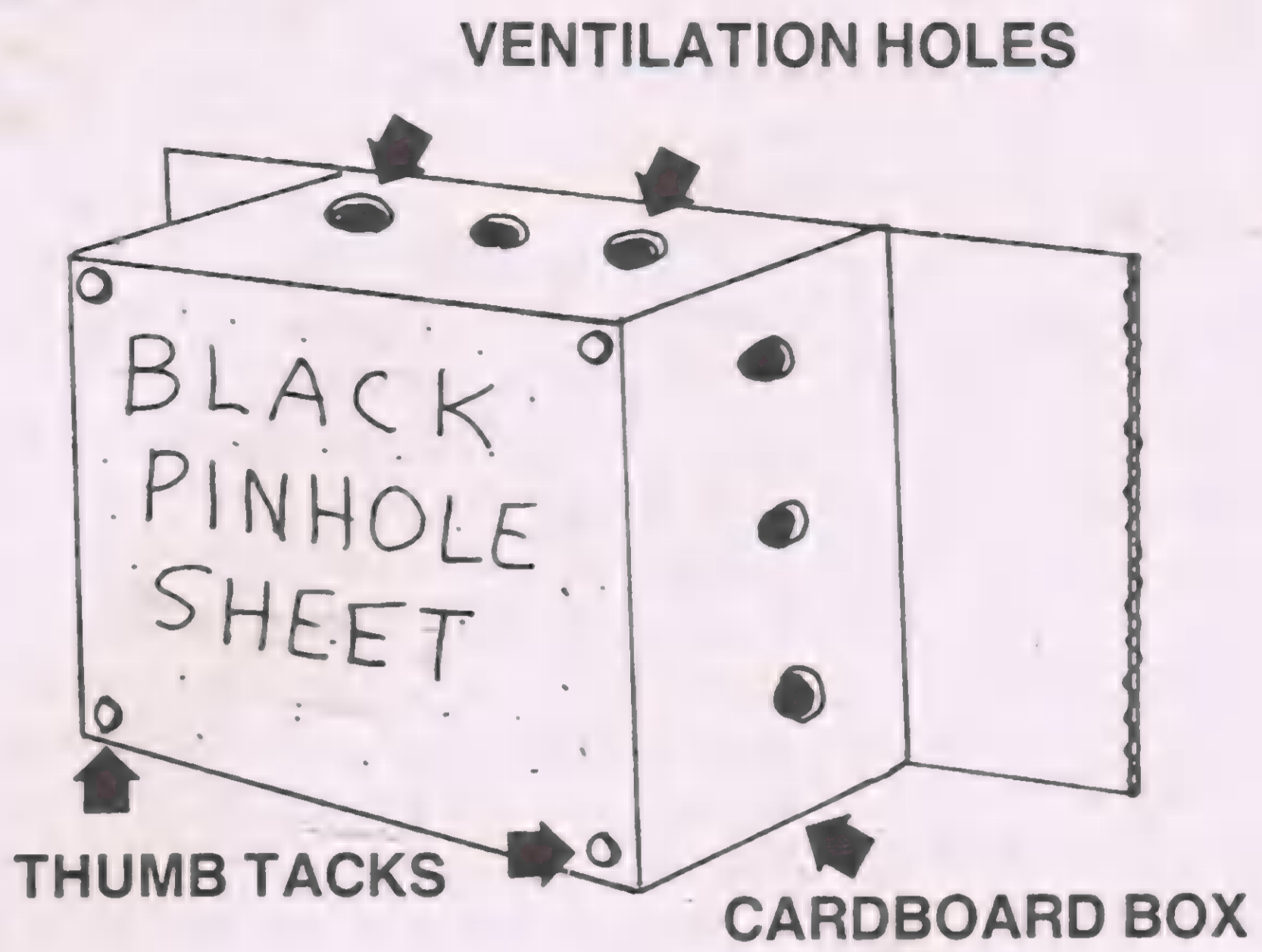
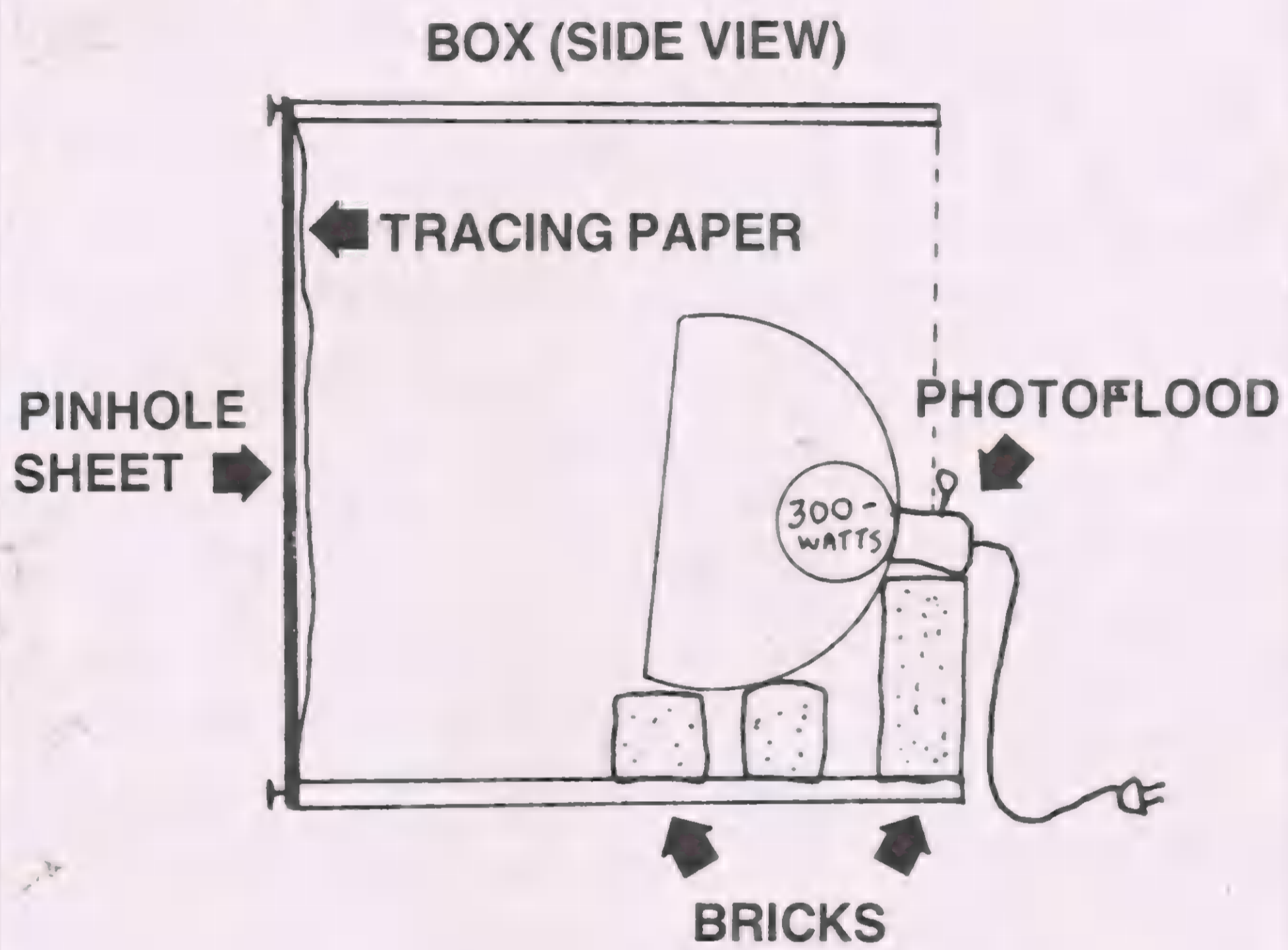


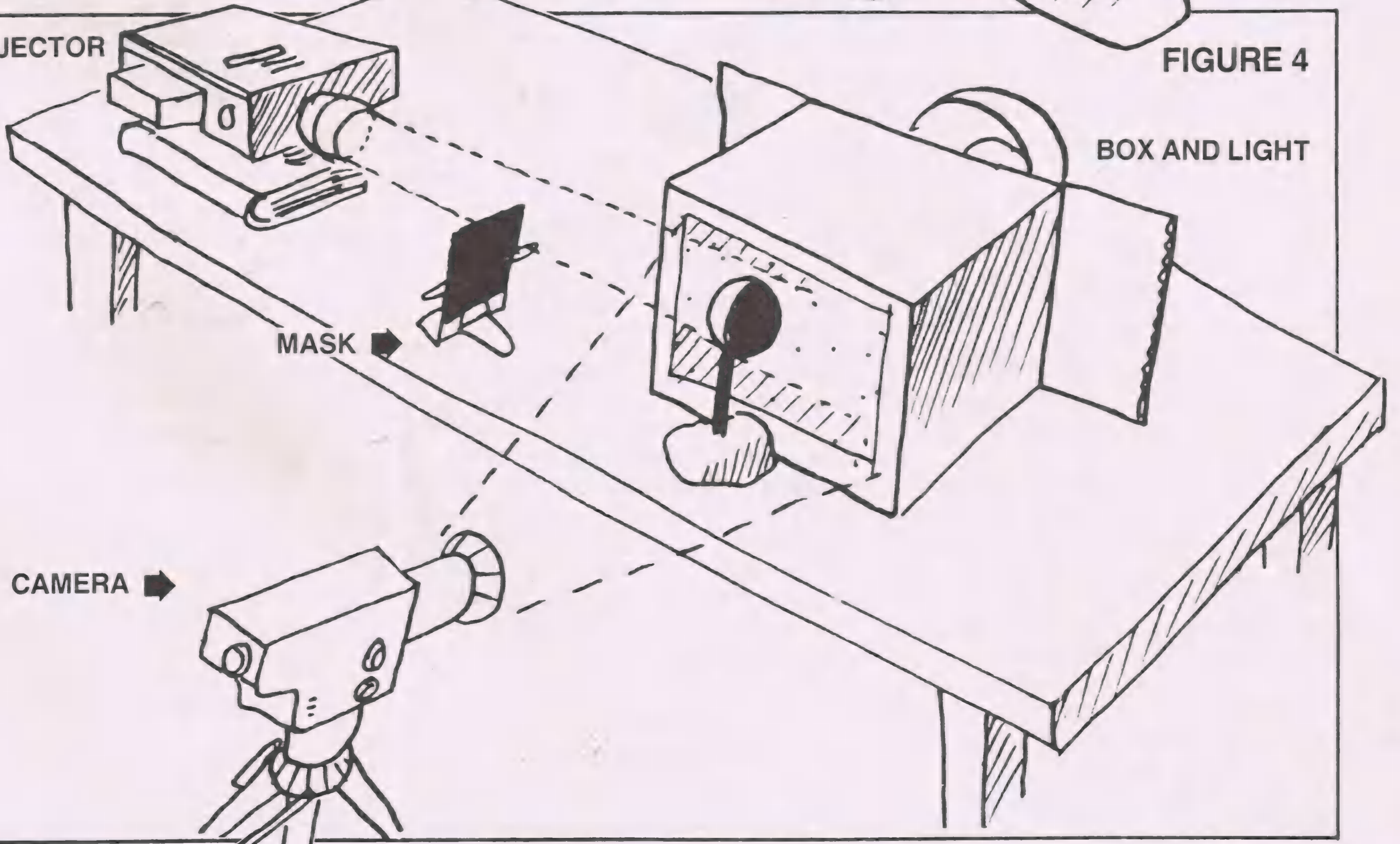
FIGURE 3

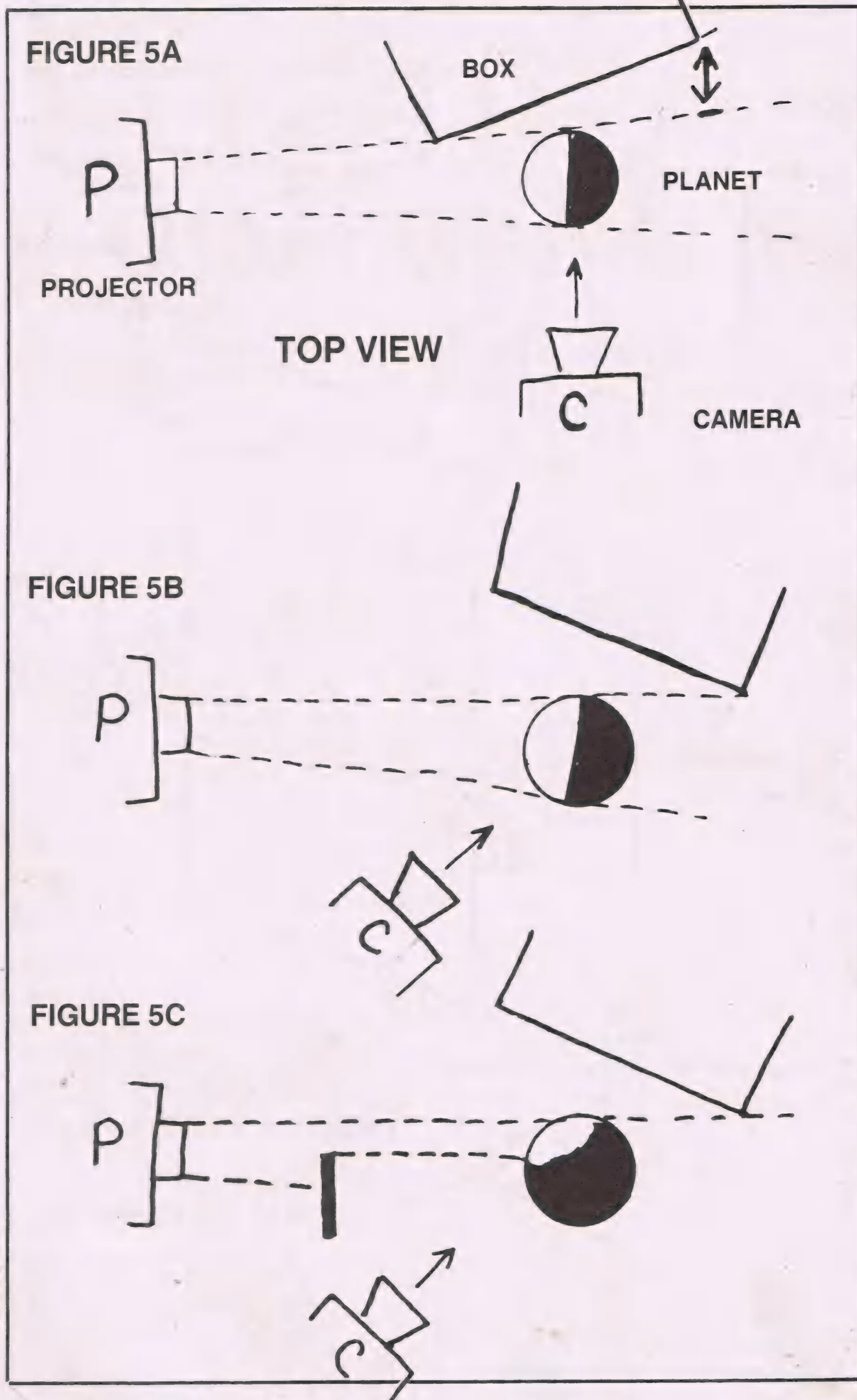


FIGURE 2B



PROJECTOR





ART: JACK IMES, JR.

THE PROJECTOR

Step 1: Use an ordinary 35mm slide projector as your planet's main light source. A slide in the projector will be seen on the ball's surface that faces the projector lens. You can make a suitable slide by scribbling a wild pattern on a blank slide using dry color markers. Better yet, shoot several slides of actual astro-scenes of planets from an astronomy book. You can also shoot other colorful scenes as well, such as heavily textured deserts, mountains, and oceans out of the *National Geographic* magazine. Even your old vacation slides may render realistic "planetary surfaces", so experiment freely.

Step 2: A nifty item to make now is the "beam mask" that is used to block unwanted portions of the projector's light beam. The mask can also be used to create a large shadow on the ball for "crescent" effects. The mask is merely a black card, 5 x 7-inches, placed upright in the beam path. It is held in place by clipping it with either paper clips or adjustable clothespins to a cheap metal-plate bookend. You can see the parts and finished mask in figure 3.

SHOOTING YOUR COSMOS

Step 1: A wide table is recommended for the photography set-up. Place the

box, planet, projector and camera as indicated in figure 4. The planet ball should be fairly close to the pinhole sheet so both will be in good focus. The camera should be loaded with a fast film for best exposure at a small shooting lens aperture.

With the projector on and box photoflood on, you should see a well-defined "half-shadow" effect on the ball. If any projected light spills onto the black sheet or stick mask, use the beam mask to block it off. You can also shift the entire box angle slightly away from the beam to remove the spill. Some focus adjustment of the slide is usually needed to give a sharp image on the ball's curved "screen" surface.

Step 2: You can arrange the lighting for various types of planet images. Figure 5A is a half light/half shadow planet. Figure 5B changes the camera shooting angle slightly toward the projector to give a fuller planet face with a slim quarter shadow. Figure 5C shows the beam mask inserted into the light path to reduce the planet face to only a sliver of light, a planet in "crescent phase."

Step 3: To rotate your planet, simply swivel the slide projector very slowly. This can be done best if the slide projector is resting on a small turntable, such as a manual "lazy Susan" dinner tray. The action of turning the projector causes the light beam to sweep across the ball. However, only the slide areas projected onto the ball is actually seen by the camera. This results in an optical illusion of colors flowing around the ball as if the ball itself was turning.

You can use the "E-Z Planet Method" to create space shots of all types for your film. A simple change of slide can give birth to an entirely new world! By use of the "E-Z Effects Filters" of previous issues you can create dazzles of starbursts, glows and nebular effects to enhance your planet shots. So experiment and have some fun, for you can have the whole solar system at your fingertips!

MATERIALS

- Rubber ball, 3-inch diameter
- Balsa stick, 1/4 x 1/4 x 12-inches
- Nail, three-penny size
- 35mm slide projector
- Slides, various
- Black art paper, two x three feet (approx.)
- Two clothespins or paperclips
- Clay or putty (about 12 to 16 ounces)
- 4 thumbtacks
- 1 sewing needle
- 1 bookend
- Tracing paper, two x three-feet (or so)
- Adhesive tape and cutting tools
- Camera, film, tripod
- Photoflood with reflector, 300-watt
- 3 bricks (or similar)
- Manual turntable (optional)

From Tupelo to Hollywood

(continued from page 9)

angles, with much less trouble. Another bonus was the superior resolution of a 35mm slide over the resolution of a 16mm film frame. Our low budget had restricted us to 16mm for the moving backgrounds, but the stationary backgrounds allowed us to use 35mm slides, which are roughly equivalent in picture quality to VistaVision.

The matter of picture quality forced us to resort to yet another means of rephotography for one extraordinary shot in which Alice, fed up with the feisty pair, picks up Shape and Form and carries them directly into the camera. I was able to successfully animate the movement of the characters toward the camera by the usual procedure. The front projection of Alice, frame by frame, allowed me to match the characters' forward movement with the position of her empty hands. But there was a problem. As Alice moved forward, the discrepancy between the projection of Alice and the first generation quality of the characters became apparent. Also, the front screen material covering the rods that the characters were mounted on became increasingly bright as they moved toward the camera and projector. (The characters could not be flown on wires because wires always cast shadows on a front projection screen.)

The solution was to rotoscope or outline the characters' movement in black ink on clear acetate cels, then to fill in the outline with black cel vinyl paint. This gave us a series of mattes which were sandwiched together with Kodaliths to produce counter mattes, or black backgrounds, with Shape and Form-shaped holes in them.

The lab made interpositives from the original negative of Alice and the negative of Shape and Form. Then Mike Griffith, another KET animator, and I rephotographed the two shots on separate passes via aerial image photography on the Oxberry animation stand. The mattes of the characters were placed frame-by-frame over footage of Alice on the first pass through the camera. On the second pass, the counter mattes were used to expose only the images of Shape and Form. The final result was a high quality marriage of the two pieces of film onto one negative.

The Arts Express Series allowed me to put into practice the special effects techniques I had studied for years. It helped me discover for myself the subtleties of special effects that cannot be put on paper. And I feel that the series helped me break some new ground as an animator. I hope that the series will open new horizons for the viewer as well. *CM*

Heads

(continued from page 32)

aluminum balls (because they are very easy to drill and tap and are lightweight), and steel plates to surround them (for good strength without great thickness). Although this technique worked, I formed an opinion that the materials should have been reversed, if used at all. Steel is a much harder metal than the aluminum alloy that the balls are made of; hence, any irregularities or burrs in the steel sockets could—and did—scratch the aluminum balls as they turned. This had a direct result on the smoothness with which the balls moved. I stress that this did not happen all the time; it was simply the result of some sockets being made better and smoother than others—good old human error. The materials work well enough; you just have to produce a nice, burr-free socket.

This reversal-of-materials theory is just that, as I haven't actually tried it; but a steel ball riding in an aluminum socket would seem to actually help smooth out the socket's burrs and rough spots, with-

out doing any harm to the harder ball.

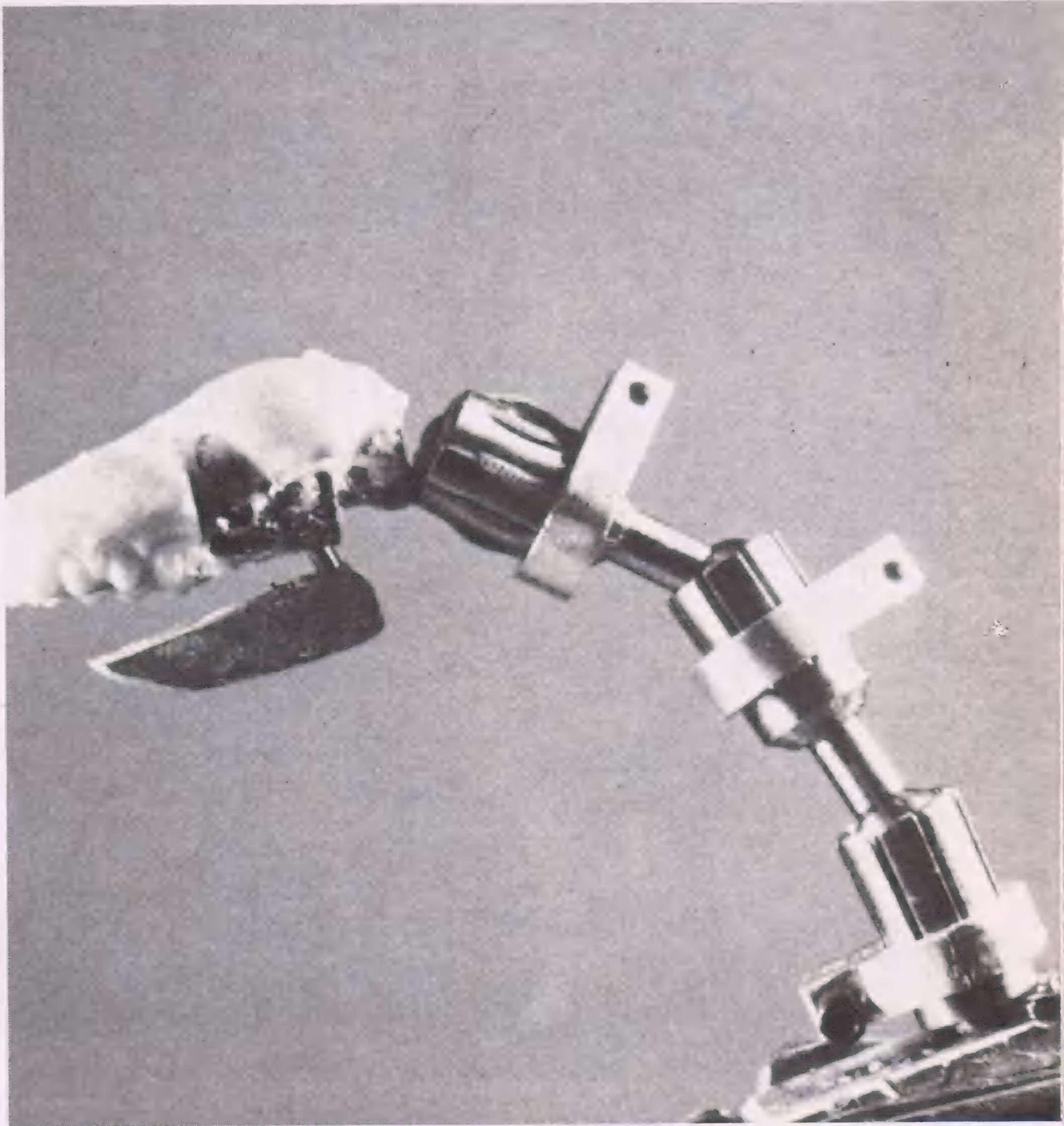
In effect, the ball would be helping to form its own socket the more you used the joint.

Stainless steel for both balls and sockets is the material of choice among professional animators and armature makers, and for good reason: it is practically indestructible. But even unhardened stainless is difficult to machine without the right tools, and when it comes to tapping, stainless steel can be very difficult—I've broken more than one tap trying it.

So where does all this leave you, the bewildered budding armature maker? Try using brass plates and bronze balls! Although brass is supposed to corrode foam rubber over time, it is a "dream metal"—it's wonderfully easy to machine, like aluminum, but is much harder. You might also want to experiment with an all-aluminum armature. However, aluminum ball sockets tend to "stick" and jerk from position to position.

Perhaps through experimentation you'll come up with the "perfect" armature materials! *CM*

The completed ball-and-socket skull, mounted on the armature. The very organic-looking "sub skull" covers the top half of the metal armature skull to help hold the shape of the stop-motion dinosaur's head.



Stop-Motion STUDIO

A "Dino" Star-Studded Cast

Despite "expert" advice to the contrary, Hydrocal is a very suitable mold-making material



Plastilina clay was used to model this baby protoceratop's torso.

By JOHN DODS

I blew it. After I had bought and paid for 200 pounds of Hydrocal mold-making material, all of my makeup expert friends told me I *should* have gotten Ultracal—a similar but harder plaster-like powder. But the Hydrocal worked great.

The three-piece mold I made of a protoceratops baby survived twelve trips to the oven to produce latex shell castings, and—after a few repairs with white glue—four more trips. I subsequently learned that I could have extended the life of the mold and prevented cracking due to the drying effects of oven heat by periodically soaking the mold in water for 24 hours and then allowing it to dry before using it again.

I mixed the Hydrocal by using a ratio of about three parts Hydrocal to about four to four-and-one-half parts water. Too much Hydrocal will produce a mold that is too crumbly, or at least not strong.

What do my friends know?

CM



Clay "seam walls" are pressed onto the sculpture to help keep the Hydrocal in the desired areas. Note the raised half-spheres used to create keys that insure that the mold sections will fit together properly.



The first section of the mold has been completed. As each section is finished, the clay wall is removed to expose the plaster which is coated with petroleum jelly or cold cream to prevent the subsequently applied plaster from sticking.



The second section of the mold has been completed.

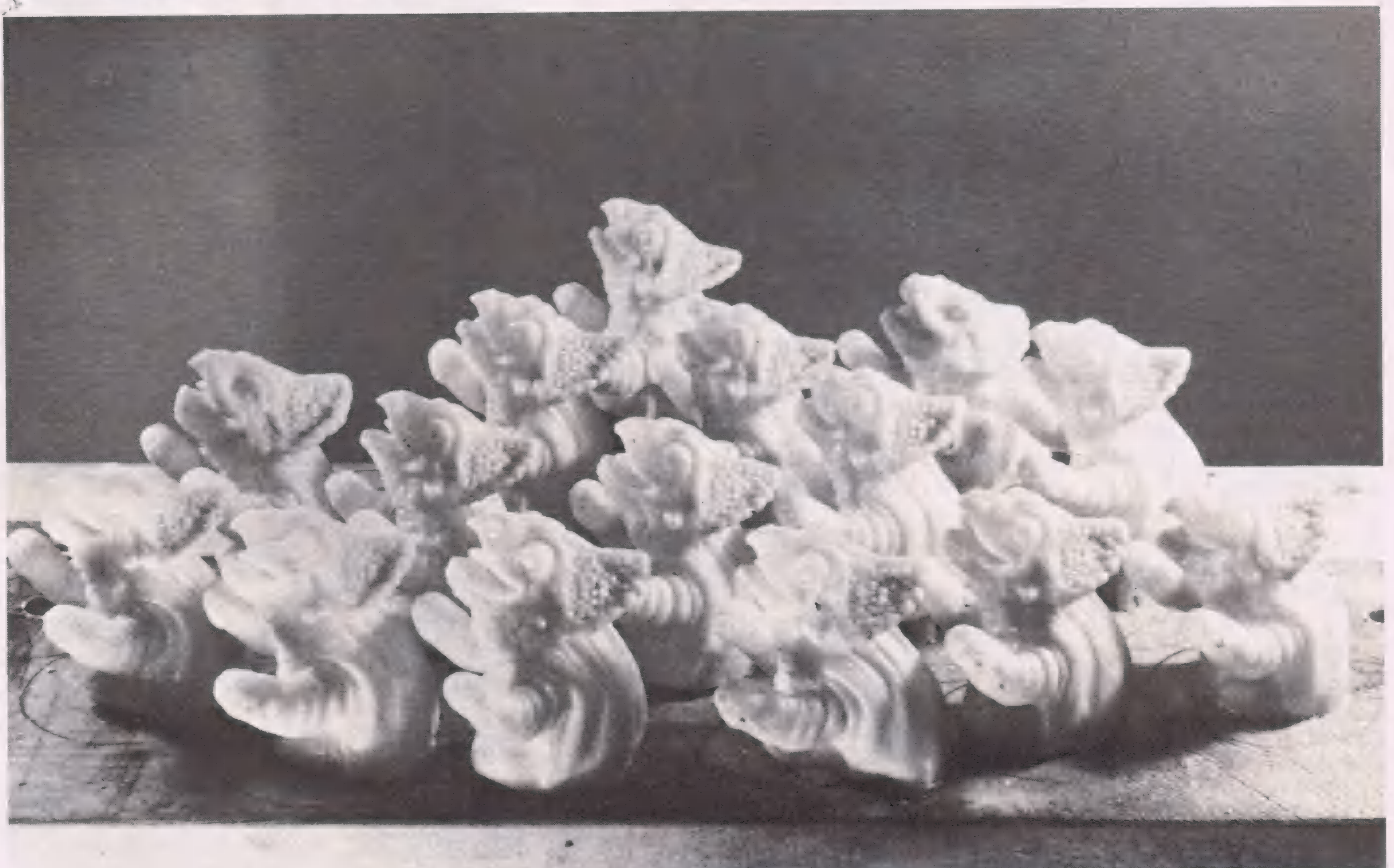
PHOTOS: JOHN DODS



The hollow shell-casting was made by pouring latex rubber into the closed mold, letting it sit there for 60 minutes to allow a skin to build up on the mold interior. The extra rubber is poured out before final curing and vulcanizing the rubber for several hours in a 225 degree oven.



The third section of the mold has been completed and the first latex "shell casting" or slush casting has been completed.



Fifteen trips to the oven later . . . A host of baby protoceratops standby, waiting to be covered with plaster "eggs" from which they will hatch in the film.

Sculpting

(continued from page 44)

ing of the armature because it is soft and easy to apply, but is not good for fine detailing. Number three is the best for over-all work, but you might want to use number four for small models or very fine detailing. Roma Plastilina costs \$2.50 per two-pound block and can be obtained from Sculpture House, 38 East 30th Street New York, N.Y. 10016.

I find sculpting tools to be very useful, if not a necessity, while working with clay. When I started sculpting I was reluctant to use tools because they felt awkward in my hands. I quickly learned how much help they can be and took the time to get to know and use them.

Sculpture House also makes all types of sculpting tools. Their Thin Line tools are perfect for model work. They are \$3.00 each and consist of an aluminum handle with various shaped wire bits on either end for sculpting.

Also, you should get some common drugstore rubbing alcohol or cold cream and some small paint brushes with short, stiff bristles. The rubbing alcohol is brushed onto rough areas of the sculpture to help smooth them out. Cold cream is alright for smoothing out larger areas of the sculpture, but it shouldn't be used too much because it will make the clay soft and pick up fingerprints easily. Rubbing alcohol doesn't have this problem because it evaporates quickly.

Getting Started

Before I add any texturing to a model, I like to have it look as if it didn't have skin, just muscle. I try to study the anatomy of different animals to help me here. Even if I invent a muscle, it still needs to look as if it could really work. The alien sculpture in the photos has a distorted human anatomy. I changed it enough to make it different but I still tried to keep it believable. Before you start, I'd like to suggest a helpful, time saving technique: sculpt the model on one side only. I usually experiment with different textures on one side. This way, if I change the design, it will just be on one side. When I'm happy with what I have on one side, I go catch up the other side.

Scales, Warts And Bumps

Once you have the basic shape of the model in clay, you will probably want to add some kind of texture or detailing to it. Scale textures are a good place to start because they are a fairly simple, yet highly effective, way of detailing. Scales also serve another purpose: they give your model scale or size. Small scales will tend to make a model appear larger and vice-versa. Ray Harryhausen's Gawangi model had scales that were only visible in closeup.

There are basically three types of scal-



This is the technique which Ken Brilliant calls "noodling." A "noodle" of clay is worked into the sculpture with a tool and then smoothed with cold cream and a brush.

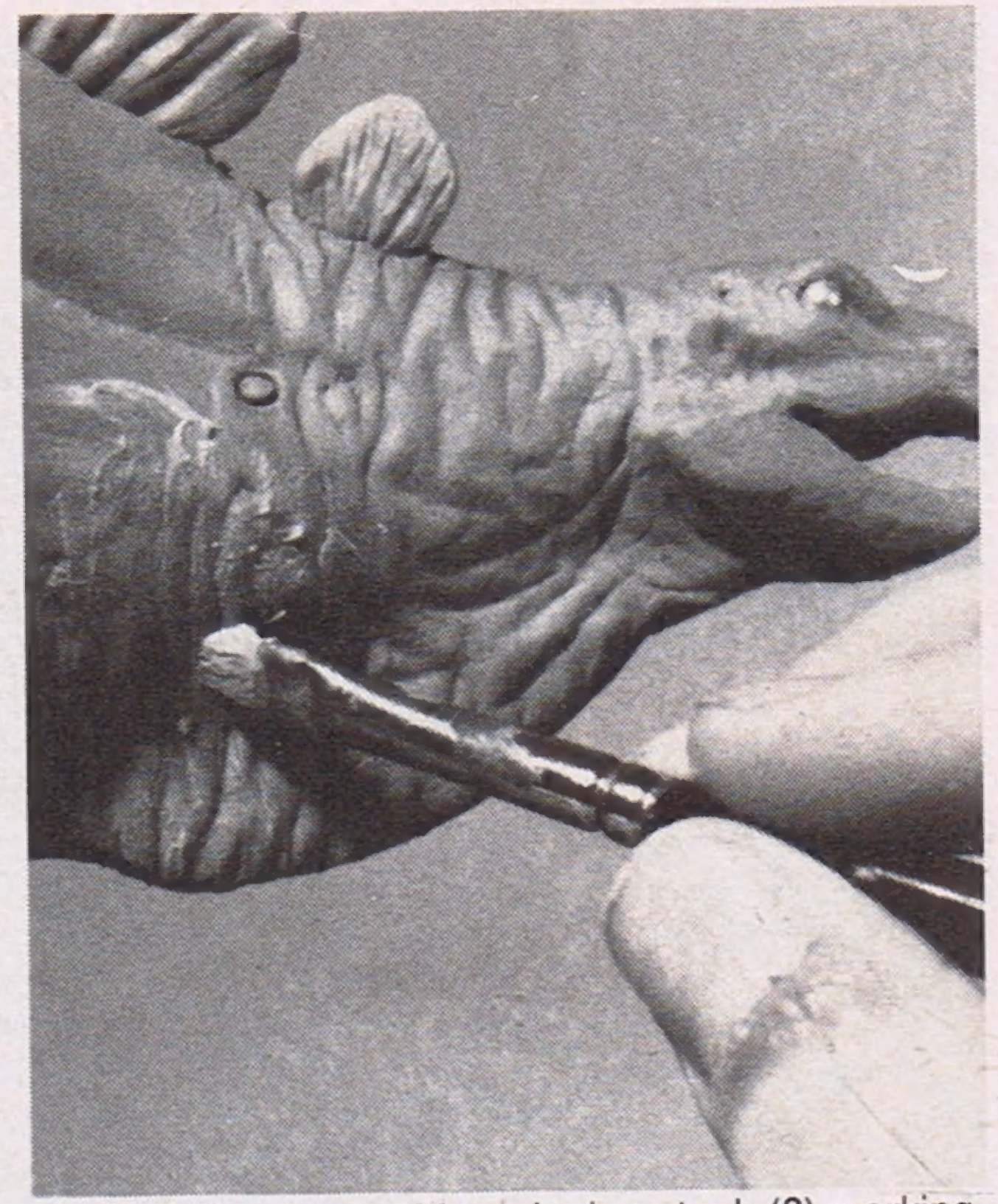
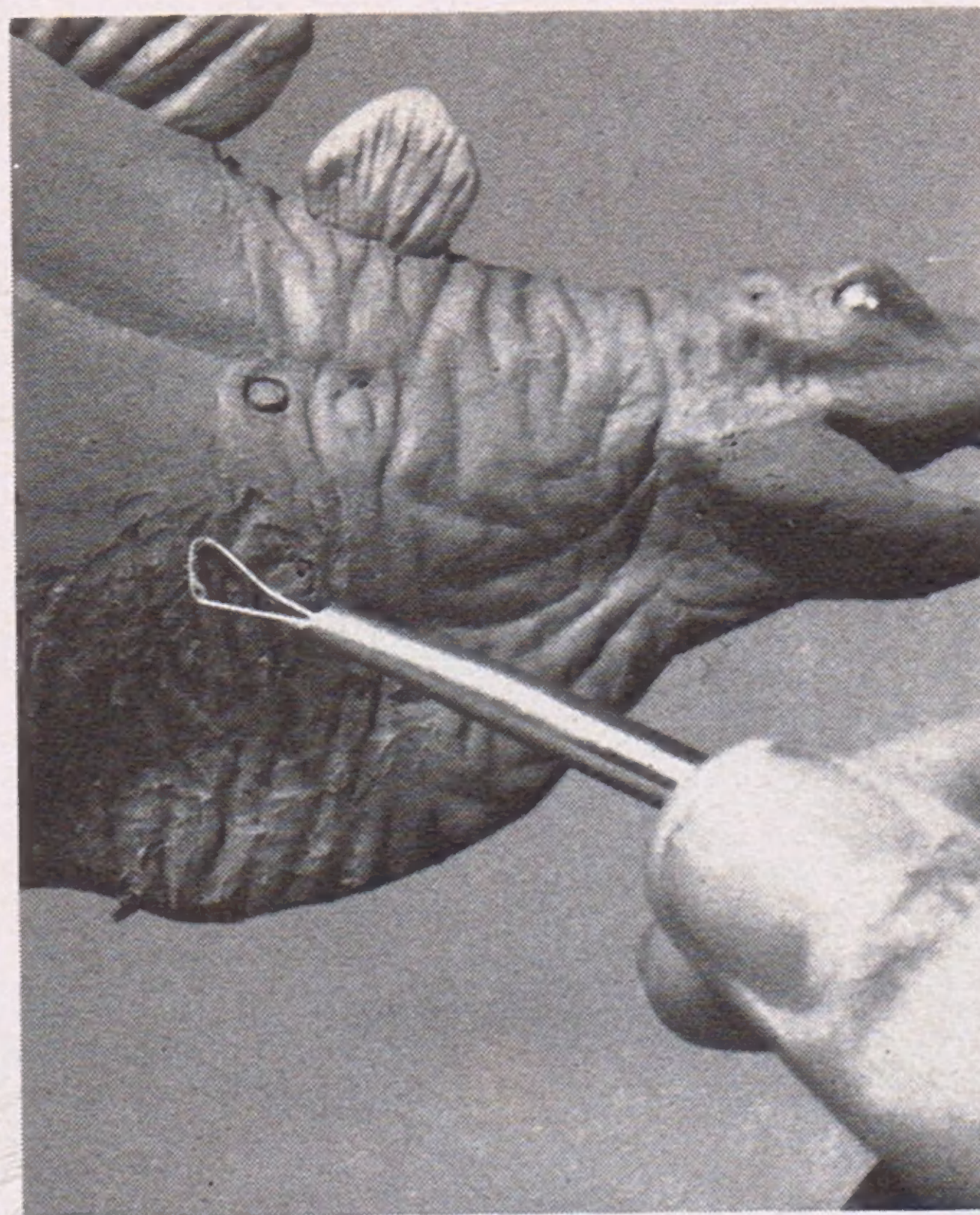
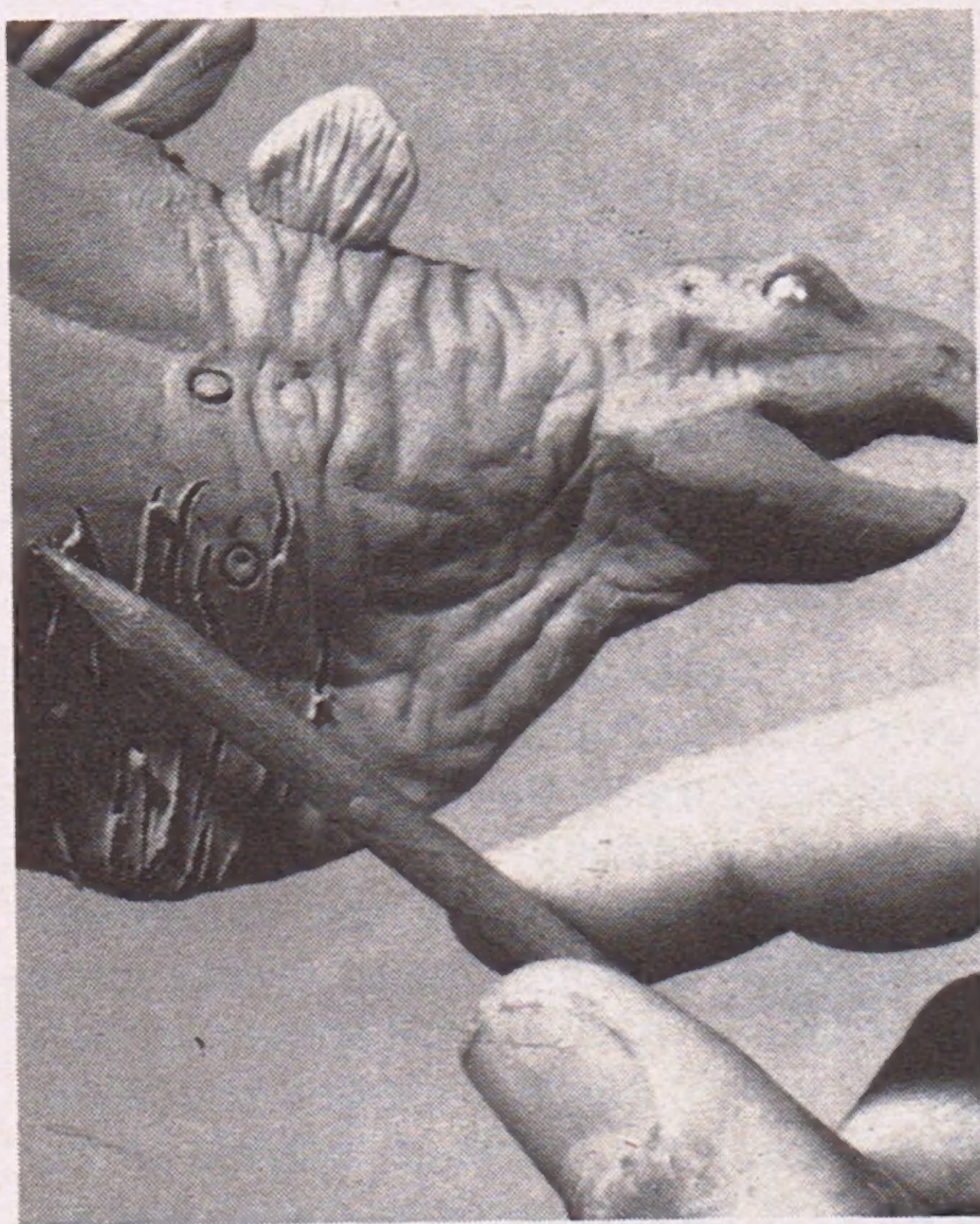


Once you have put your "noodle" in place, burnish it down with a sculpting tool so there are no hard edges.



The final step in the "noodling" technique is to smooth over the new piece of clay with a brush dipped in rubbing alcohol.

PHOTOS: KEN BRILLIANT



The procedure for detailing the neck of the creature includes: (1) working the basic line with a pointed tool; (2) smoothing the shape with a wire loop tool; (3) working out the rough edges with a brush and cold cream.



Scales and texture are worked in very broadly at first using a cross hatch pattern. Then a sculpting tool is used to round out the basic shapes on the surface of the creature.

ing that I like to use: pebble, free hand and texture stamping.

Pebble texturing is probably the easiest, yet it is still highly effective. Pebbling consists of rolling little balls of clay and applying them directly to the sculpture in any pattern you desire. A whole model can be detailed in this manner. It helps to vary the size of the balls: making them smaller around the face and limbs, and larger on the back of the creature. If the balls are very close together, they probably won't need any smoothing with the brush and rubbing alcohol.

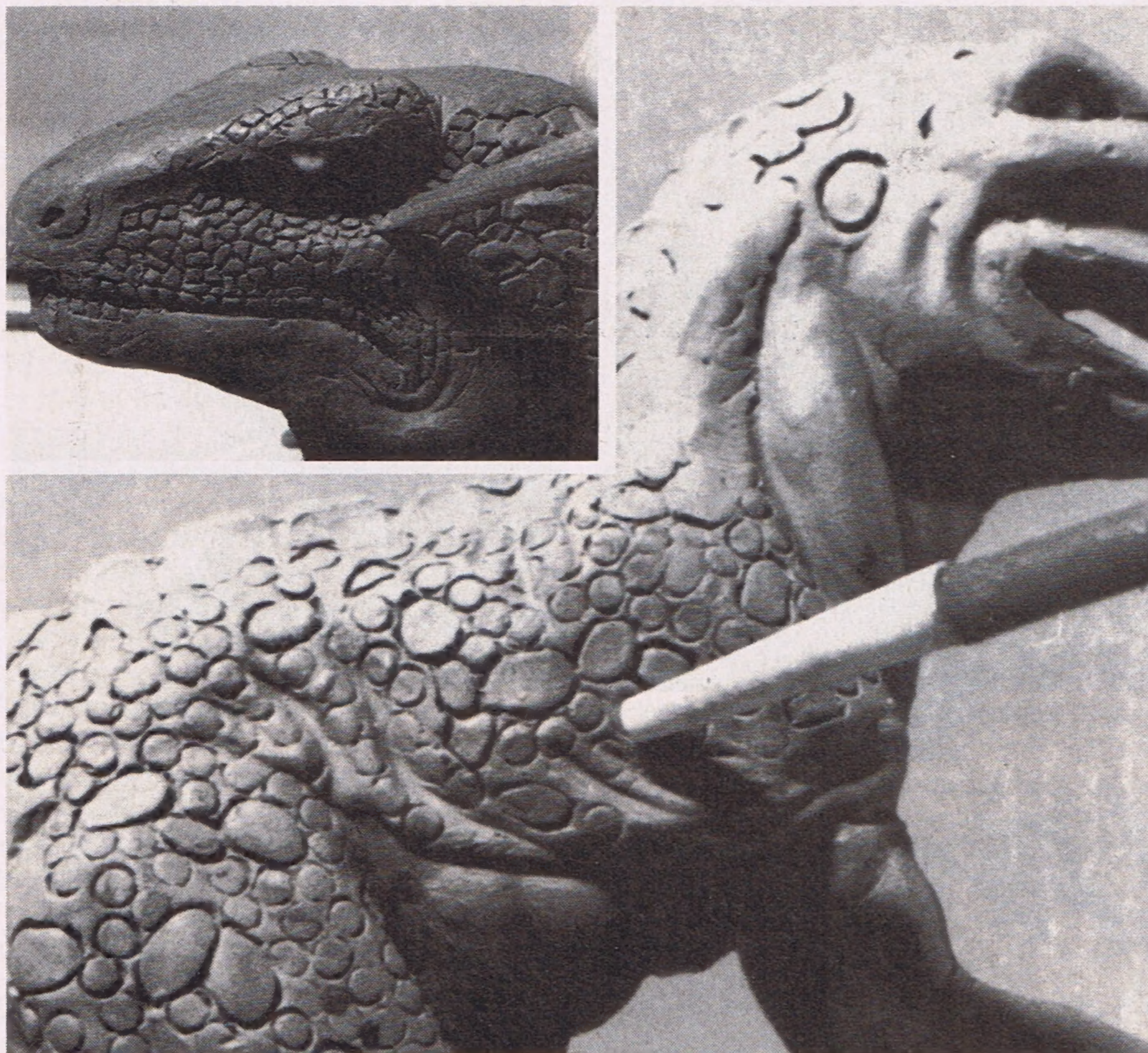
If you decide that you might want the pebbles to have more space between them, you'll need to do some smoothing

out. To do this, make a pebble or ball slightly larger than you want and place it on the sculpture. Then, with a tool, burnish down the sides so they blend with the sculpture and there are no hard edges. Then, if necessary, smooth over that with a brush dipped in rubbing alcohol.

Free-hand scales give a different effect than pebbles; they are a bit more versatile but also require more time to make. With a small pointed stick, or even a pencil, each individual scale is carved into the sculpture. You can vary the size and shape of each scale to your liking—creating an interesting variety of textures. Much cleaning up with the brush

and rubbing alcohol is necessary during this stage because the carving creates many rough edges and loose bits of clay.

Scales can also be made quickly with impression devices. Old paint brushes with the bristles pulled out or pencils with the erasers removed work very well for this technique. With the bristles out of the brush, there is a metal or plastic collar left. This is lightly pushed into the clay, leaving behind a circular scale. The brush or pencil collars can also be bent to create a less circular shape. A variety of brush and pencil sizes and some free-hand scales here and there is probably the best way to keep the model from looking too uniform and unnatural.



Scales can also be worked into the clay using a brush from which the bristles have been removed. The open metal collar works a little like a "cookie cutter," but the artist can exert quite a lot of control in the handling of the tool. Inset: Small scales are worked in individually with a pointed tool.

Wrinkles

Wrinkles are probably the hardest texture to reproduce on a sculpture, but they are worth the effort. A good set of wrinkles can make a model seem alive.

Again, before you start, study pictures and observe the way the skin on animals — humans included — folds, stretches, bends and wrinkles. It's a good idea to make a collection of pictures depicting

different skin types. *National Geographic* is a marvelous source of animal pictures such as elephants, rhinos and lizards.

Putting wrinkles on my models is often a combination of adding and taking away clay. Usually, I start off by using a pointed stick to carve out the areas where I want the main wrinkles to be. Then, with the flat edge of a tool, I take the hard 'edge' off. I try to get them as smooth as I can before I use the brush and rubbing alcohol. After this, I go back and add some more wrinkles or make the ones already there deeper if necessary.

I quite often add to the carved-out wrinkles by adding clay to create more wrinkles. To do this, I roll some clay into a thin worm, slightly longer and wider than I want the finished wrinkle to be. After placing the worm on the sculpture, making sure it is positioned properly, I burnish down the sides with the edge of a tool. Again, I try to get the wrinkle as smooth as I can before I use the rubbing alcohol and the brush to smooth the rest. The rubbing alcohol doesn't work miracles. It won't make a ragged line perfectly smooth. Most of the work needs to be done with a tool or your fingers.

Before I conclude, I'd like to say that although I broke down detailing into two basic types, a model doesn't need to be either wrinkled or scaly. Quite often, the most interesting models use a combination of wrinkles, scales, bumps, warts, etc. Don't be afraid to change your sculpture, because you can always change it back! Experiment and explore; the only limitation is your imagination! *CM*

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Sculptor, filmmaker Ken Brilliant stands amidst a grouping of dinosaur sculptures that are under construction for John Dods' current film project—a musical set in the primeval world. Ken says that sculpting your creatures in clay, as opposed to the "build-up" method of construction, gives the filmmaker ultimate control over the look of his creatures.



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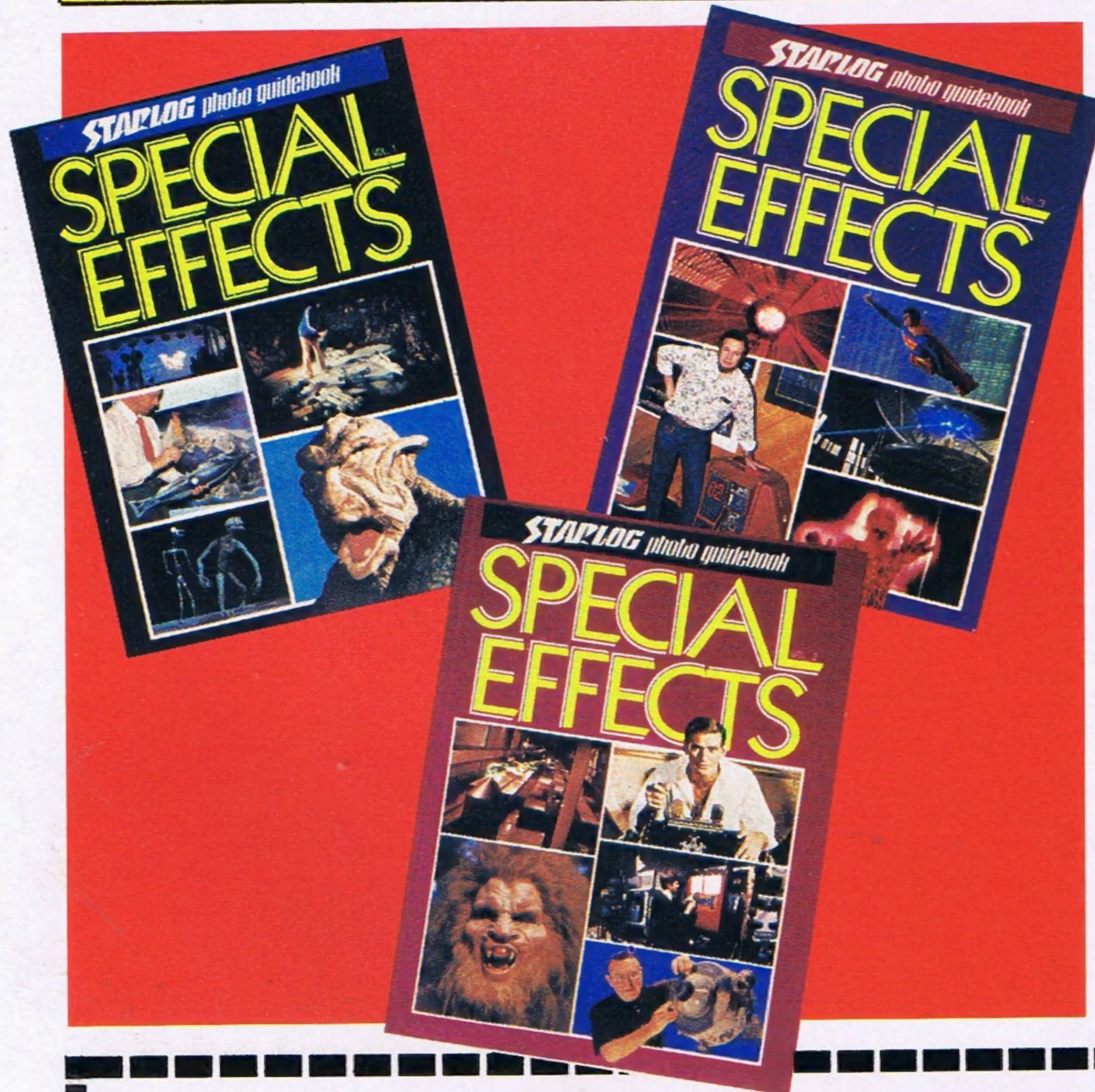
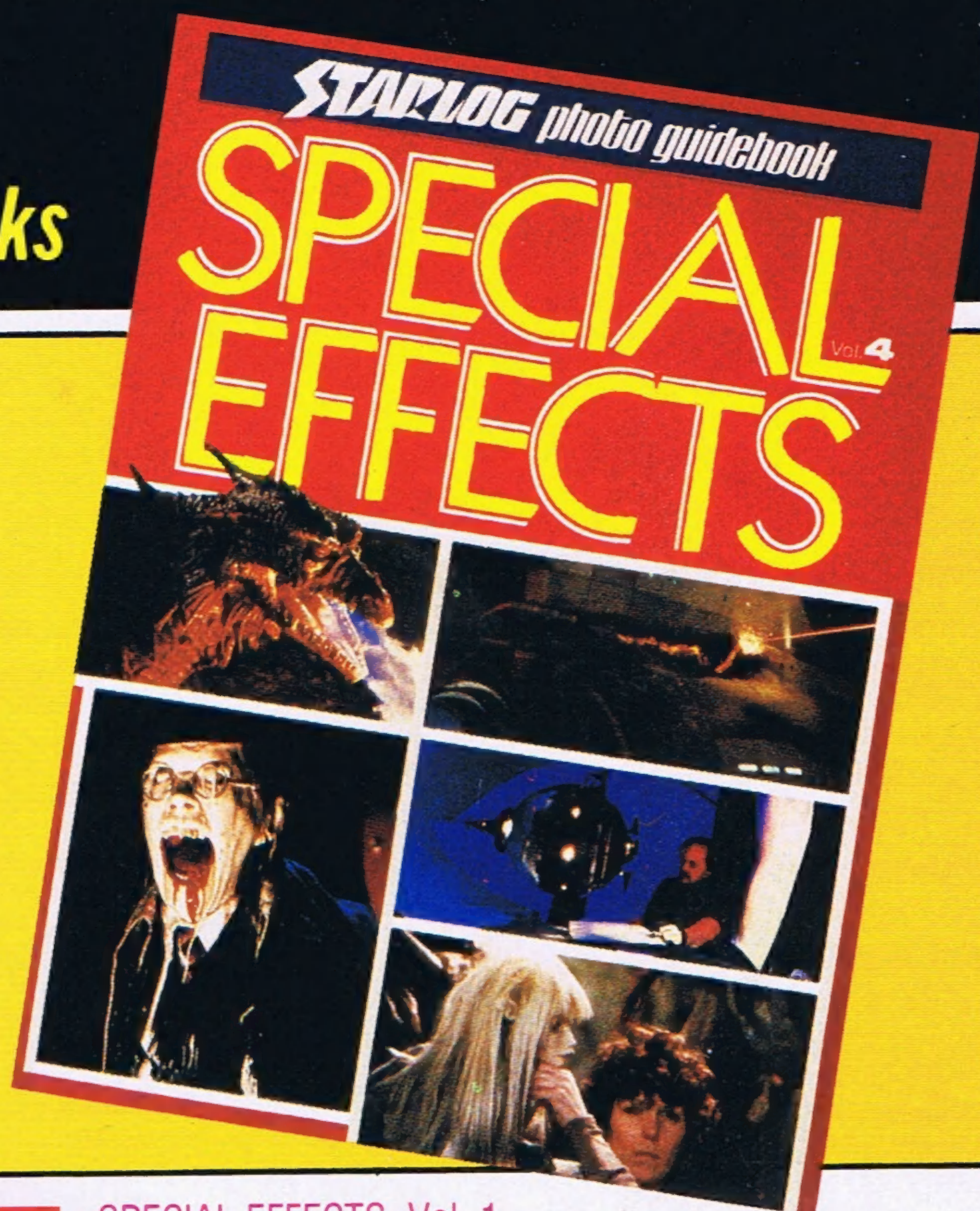
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